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Lathe for Irregular Forms.

Lathes for turning irregular forms are now in general use in all the large armories throughout the country, and manufacturers of muskets would have been greatly delayed in filling their contracts but for the existence of this machine. The principle of it is that a pattern held in such a manner that it revolves against a roller, communicates motion to a vibrating frame, wherein the stuff to be worked is also set in centers, both sets of centers having the same motion, so that every movement of the pattern is communicated to the work. A revolving cutter wheel then acts on the work as it is brought in contact with it by the pattern moving the frame up and down, so that a perfect fac simile of it is made, either larger or smaller, as the machine is constructed.

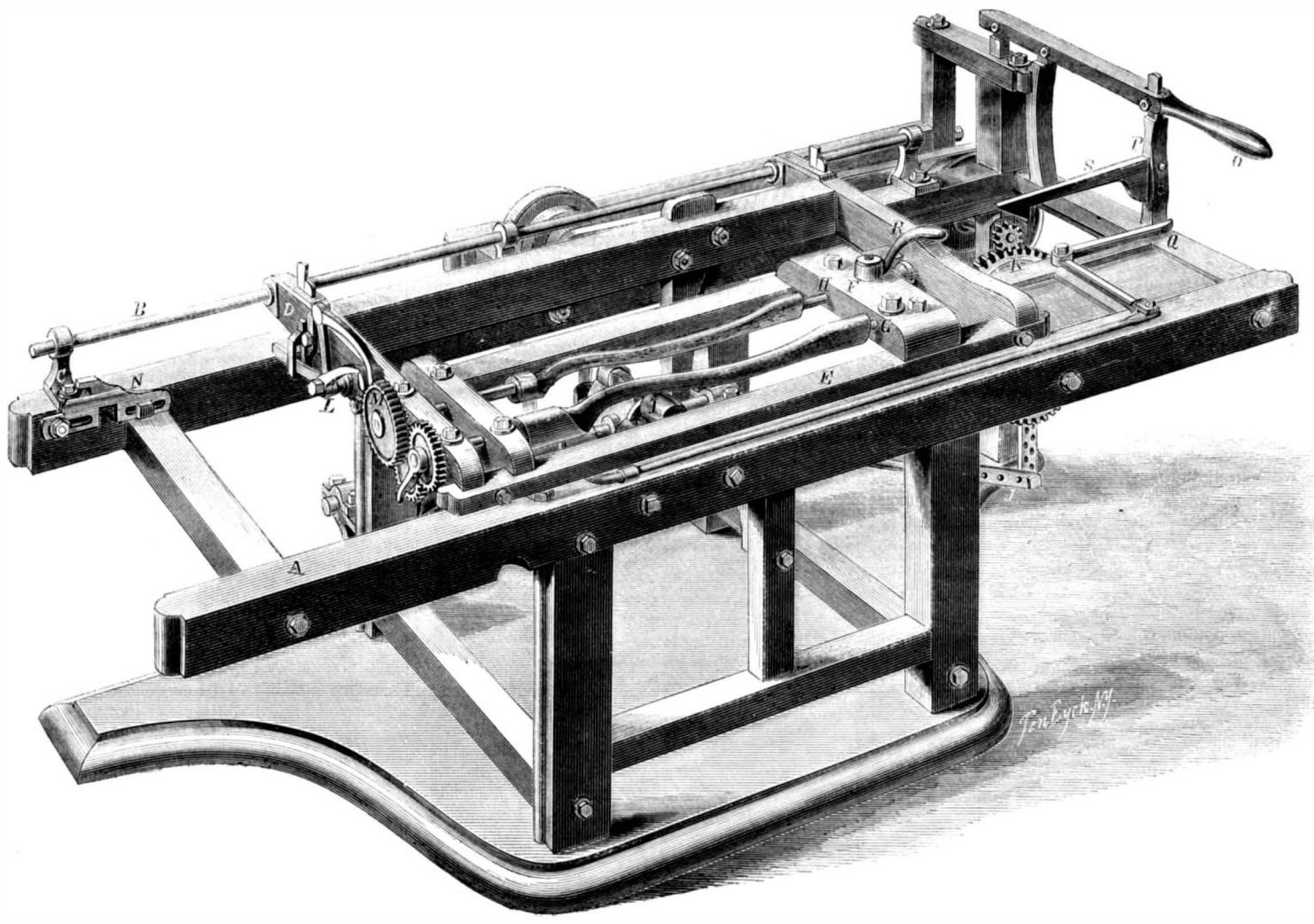
In this machine, A is the main frame, on which there is a rod, B; this rod is firm in the standards, C, and is embraced by the bearings, D, which are merely prolongations of the carriage, E. The office of these bearings is to guide and steady the carriage, and provision for wear is made by the keys and brasses in them. The carriage vibrates up and down at the furthest end from these bearings, acting on them as a door on its hinges. Inside of this carriage, on a suitable framing, F, are the two centers, G and H. The pattern to be reproduced in wood is set in the center, G, and is made larger than the finished job will be, for the work being nearer the center of vibration, will have less movement and therefore be smaller.

The pattern runs against a fixed roller, I, which causes the carriage to lift vertically, as before stated. It is this roller which guides the pattern, or the movement of the carriage up and down; when, in addition to this, the carriage is drawn along horizontally by the rod, J, driven from the gearing, K, a perfect fac simile of the pattern is made as regards the shape. At one end of the carriage there are a series of pawls, L, which act on ratchet wheels, M. These pawls strike inclined planes, N, as the carriage progresses, and cause the pawls to move the ratchet wheels partly round, rotating the pattern and presenting a new surface for the cutters to act on.

The handle, O, and post, P, are to raise the latter so that a dog, Q, will be thrown out from under the post when the work is done, and stop the machine by depressing the driving gear, K, so that it is out of mesh with the pinion. Provision is also made for altering the length of the driving rod, so that shorter work than an axe handle may be turned in it. The handle, R, is merely to hold the center, H, so that it will not slip; when the carriage is run back out of gear, the catch, S, falls over it, and holds it so that it cannot be started until it is removed.

These lathes are used for turning ax handles, hammer handles, lasts for boots, busts, gun stocks, chair legs,—in short any thing in wood that is irregular or uneven in outline

This lathe was patented on the 3d of March, 1863, by E. K. Wisell, of Warren, Ohio, for further information address him at that place.



WISELL'S LATHE FOR IRREGULAR FORMS.

Mechanical Skill of English Burglars.

THE art of burglary has all but risen to the dignity of a science. The gentlemen of the pick-lock and the crowbar manage their little affairs with a skill, a forethought, and a consummate adroitness worthy not only of a better cause, but of a species of admiration—not, perhaps, that which honest men would like to deserve, but nevertheless very satisfactory, we feel little doubt, to the thoroughly professional thief. Mechanical engineering loses nothing of its honors in such hands, and we question if the practical application, at least, of the forces of nature, is better understood in the great work-shops of the country than it is in "Thieves'-alley," or "Rogues'-walk."

Every mechanical engineer is aware that the best tool steel is a very different article from even first-class plates. It is capable of taking a better temper and of being made considerably harder, and, as a consequence, drills can always be produced by careful manipulation which can find their way through the hardened sides of a steel safe with moderate facility.

The art of making such drills is one of the burglar's trade secrets. His tools cannot be excelled in their beauty of finish and admirable quality. Nearly two tuns of "jemmies," drills, chisels, &c., were sent a few months since from the London police offices to one of the dockyards to be worked up, and we question if any iron or steel distantly approaching this in quality had ever found its way into Government "scrap" before.—*Engineer*

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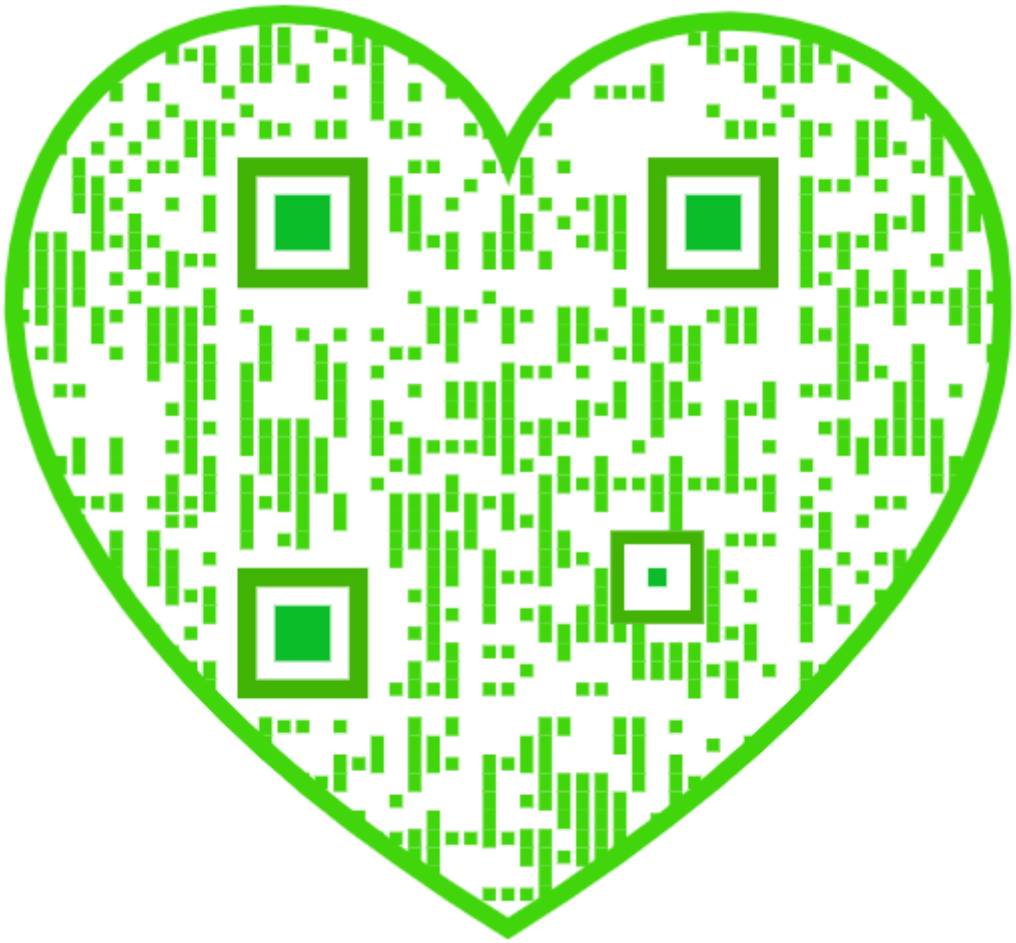

APPLICATIONS OF GLYCERIN.

BY W. J. M. GORDON.

Glycerin, it is generally known, possesses a wonderful range of solvent properties, dissolving many substances not soluble in alcohol or water. Its agreeable taste, harmless action upon the system and perfect assimilation with human digestion, specially adapt it when other substances would be rejected. Its sweetening property being almost equal to cane-sugar sirup, but differing from it in not being liable to fermentation; resembling oils, but, unlike oils, miscible with alcohol and water in any proportion; not volatile at ordinary temperatures, and not becoming hard at the freezing point of mercury. Possessing these properties, it cannot but be an article of importance both in pharmacy and in the arts.

The high price, heretofore, no doubt, has kept it from many uses to which it is now applied. Recently, glycerin, adapted to the various purposes to which it is extensively used, has been produced at a lower price than alcohol, sugar, or oil, which it has come in competition with, and whose places it seems specially adapted to fill to a considerable extent; and the large amount and low price at which it can be produced, makes it worthy of attention at a time particularly when every article of utility should be carefully looked after.

Medicinally, glycerin has been used for its nutritive and alterative effect, and in some cases with marked success, being admissible when cod-liver oil and other unpleasant substances would be rejected. These and its soothing effect in coughs, are the principal internal uses to which it has been applied alone. Its more important medicinal value is as a vehicle for the preparation of a great variety of remedies for both internal and external use.

It is a favorite article in combination with the hypophosphites, known as glycerole of hypophosphites and never disagreeing with the most delicate stomach, as sugar is liable to do, is admissible when sirup is not.

Iodide of iron prepared with it in the place of sirup makes a handsome and permanent preparation.

Its preservative and solvent property being so much greater than that of sugar sirup, cannot fail to recommend it in the place of that substance for the preparation of ipecac, senega, hive sirup and such vegetable preparations as are liable to fermentation, specimens of several I now exhibit made with glycerin, costing $2.00 per gallon, which are elegant in appearance, and will undoubtedly remain without change an indefinite length of time.

Its uses externally are numerous. For chapped skin and rough and excoriated surfaces, it has no equal; for sore nipples, skin diseases, ulcers of various kinds, to prevent excessive suppuration and cleanse the secreting surface.

It is highly recommended in deep abscesses with diseased bone, combined with iodine, which it dissolves. With many, it is a favorite mode of applying iodine and its salts.

It is used in cerate, and ointments, which do not become rancid so soon when combined with it; as glycerole of lead, in place of Goulard's cerate, glycerin being used in the place of wax and oil; as glycerole of kino, which to said to be unchangeable; in the preparation of lactucarium in a liquid form, by which its activity and reliability are more certain; as glycerole of aloes, tar and arnica for external use. It is used with starch in the proportion of 1 oz. of glycerine to 70 grs. of starch for making an article called "plasma," as a substitute for lard or cerate. And it no doubt possesses advantage in preparing vegetable extracts, such as belladonna, aconite and others for external use, as they can be readily mixed with it; for liniments, in the place of oil, as it will not become rancid; and has been suggested for the extraction of the active principles of vegetable substances in place of oil and fats, to be used in the preparation of cerates or ointments.

Incorporated with vegetable extracts, it will prevent moldiness and keep them soft, and for pill masses liable to become hard it is a good addition. It may be used as an addition to poultices to keep them soft, or any article to be kept in a moist or plastic condition.

Its solvent and preservative properties are of great importance to the pharmaceutist. In the preparation of fluid extracts, it will be found to supply the place of alcohol and sugar to much advantage. My experience is such as to convince me that in most cases extracts will be more permanent by supplying the place of alcohol used to preserve them with glycerin. To fluid extract of Jalap, Veratrum viride, Cinchon. aromat. and Iris versicolor, glycerine was added and all the alcohol evaporated out, specimens of which I now exhibit, presenting a handsome appearance. Sarsaparilla and those liquids liable to fermentation will be much better preserved with it.

I have used glycerin as a menstruum in the preparation of extracts of cloves, nutmegs and Ceylon cinnamon, and the preparations are elegant representatives of the substances from which they were made.

It dissolves the vegetable acids, most of the vegetable alkaloids, sulphuret of potassium, permanganate of potassa, sulphate of copper, zinc, iron and potassa, alkaline and some of the metallic chlorides;

Iodide of ammonium, cadmium, zinc, potassa, sodium, lime and manganese;

Freshly precipitated carbonate of iron;

Most of the metallic oxides to some extent;

Nitrate of potassa, silver, copper and lead;

Citrate of iron, citrate of iron and quinine, citrate of iron and strychnia, tartrate of iron and potassa;

Pyrophosphate of iron, and most saline substances.

Heating to give it greater fluidity will generally increase its solvent property.

It may not be amiss to name other purposes for which glycerine is largely used. Much the larger quantity used for any one purpose, except that of filling gas meters, is in the manufacture of hair oils, tonics and washes, for which it is admirably fitted, taking the place of alcohol and castor oil, which are now too expensive for the purpose, and by its undrying property keeping the hair moist in appearance.

It is largely used in tobacco, and is particularly adapted to the article known as fine-cut, preserving it in a moist state an indefinite length of time; and, unlike sugar, molasses and infusion of liquorice, which has been used for the same purpose, it will not turn sour, and is unchanged by exposure to the air.

Wine and liquor manufacturers use it to improve liquors, by giving body and removing the fiery taste.

It is used by manufacturers of woollen goods in place of oil, being more economical and not requiring soap to wash it out.

Manufacturers of cotton goods use it in size to prevent rapid drying.

Printers use it in place of molasses to make rollers, which will not dry and shrink.

It is used by artists in clay and plaster of Paris, to preserve it in a plastic form for modeling.

It is used in soaps.

For filling wet meters, used in measuring illuminating gas, it is now extensively used, and possesses decided advantage over whisky or any substance before used for the purpose. It is practically free from any objection, not evaporating at any ordinary temperature, and can be sufficiently diluted to prevent its absorption of more water from the gas, and not liable to freeze at any degree of cold meters are subject to, and rendering them free from the attention necessary if filled with whisky or water.

It deserves attention as a lubricator for fine machinery, not congealing or being affected by exposure to the atmosphere.

Numerous other applications have been made of it, and its uses will increase as its wonderful properties become known.—*American Journal of Pharmacy.*

MAGNESIUM LIGHT.—The magnesium light has just received a new application in France, in connexion with the laryngoscope, a small apparatus consisting of two mirrors by means of which the lower parts of the larynx may be conveniently brought to view. A polypus seated deeply in the throat of a patient of Dr. Fournie's was examined by means of M. Mathieu Plessy's lamp, specially constructed for the magnesium light. Strong rays were projected on the mirror placed at the furthest end of the fauces, and those parts were depicted on the mirror, which was too small to be clearly observable at a distance. But on placing a bi-convex lens before the patient's mouth, the image became so enlarged that every-one could distinguish it from a distance of a few yards.

Useful Practical Receipts.

Impressions From Coins.—A very easy and elegant way of taking the impressions of medals and coins, not generally known, is as follows:—Melt a little isinglass glue with brandy, and pour it thinly over the medal, so as to cover its whole surface; let it remain on for a day or two, till it has thoroughly dried and hardened, and then take it off, when it will be fine, clear, and as hard as a piece of Muscovy glass, and will have a very elegant impression of the coin. It will also resist the effects of damp air, which occasions all other kinds of glue to soften and bend if not prepared in this way. If the wrong side, of the isinglass be breathed on, and gold-leaf applied, it will adhere, and be seen on the other side, producing a very pleasing effect. Isinglass glue, made with water alone, will do nearly as well as if brandy be used.

Medals may also be copied by surrounding them with a hoop of paper, and pouring on them plaster of Paris (mixed with water to the consistence of cream) to the depth of about half an inch. Melted wax, stearine, fusible metal, or any similar material, may be used in the same way. If it be desired to copy the metal in copper, a mold should be first formed in the above manner, and the metal deposited on its surface by the agency of electricity.

Congreve Matches.—Put phosphorus 40 grammes into a wide-mouthed vial, with enough oil of turpentine to cover it, add flowers of sulphur 10 gr., and put the vial into hot water (using great caution) until the phosphorus is melted. Then cork close and agitate until cold, when any supernatant spirits of turpentine must be poured off. Into this pulpy mass the extremities of the matches are dipped, and when they have become rather dry, they are again dipped into the following mixture: Gum arabic 30 grammes, (dissolved in a little water;) chlorate of potassa 20 grammes; soot, or vermilion, (rubbed up with a few drops of alcohol,) 10 gr.; mix, and dip the tips of the matches therein as before, then dry them cautiously in a warm apartment. These matches inflame without fulmination (noise) on being rubbed against any rough surface.

Mahogany Stain.—1. Pure Socotrine aloes 1 oz.; dragon's blood ½ oz.; rectified spirit 1 pint; dissolve, and apply 2 or 3 coats to the surface of the wood; finish off with wax or oil tinged with alkanet.

2. Wash over the wood with strong aquafortis, and when dry, apply a coat of the above varnish; polish as last.

3. Logwood 2 oz.; madder 8 oz.; fustic 1 oz.; water 1 gallon; boil 2 hours, and apply it several times to the wood boiling hot; when dry, slightly brush it over with a solution of pearlash 1 oz, in water 1 quart; dry and polish as before.

Mosaic Gold.—Copper and zinc equal parts; melt together at the lowest possible temperature at which copper will fuse, and stir so as to produce a perfect admixture of the metals; then add gradually, small portions of zinc at a time, until the alloy aquires the proper color, which is perfectly white, while in the melted state. It must then be at once cast into figured molds.

Mouth Glue.—Best cake glue; dissolve in a little water, and brown sugar a small quantity, and some essence or juice of lemons, pour it into greased molds, and dry it. When used, it is wetted with the tongue, and rubbed on the paper to be joined.

Ginger Beer Powders.—Powdered white sugar 2dr.; powdered ginger 5 grs.; carbonate of soda 26 grs.; mix, and wrap in blue paper; tartaric acid 30 grs.; wrap in white paper. For use dissolve each separately in half a glass of water, mix, and drink while effervescing.

Scent Powders.—1. Corianders, orris root, rose leaves, and calamus aromaticus, of each 4oz.; lavender flowers 8 oz.; rhodium wood 1 dr.; musk 20 grs.; mix, and reduce to coarse powder.—2. Corianders, orris, calamus aromaticus, and red roses, of each 1 oz.; lavender flowers 2 oz.; mace and cloves, of each 1 dr.; essential oil of almonds 10 drops; mix as last.—3. As last, but substitute musk 3 grs. for oil of almonds. Used to fill scent bags, and for boxes, &c.

Pyrotechny.—The three prime materials of this art are, nitre, sulphur, and charcoal, along with filings of iron, steel, copper, zinc, resin, camphor, lycopodium, &c. Gunpowder is used either in grain, half-crushed, or finely ground, for different purposes. The

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longer the iron filings, the brighter red and white spots they give; those being preferred which are made with a coarse file, and quite free from rust. Steel filings and cast iron borings contain carbon, and afford a more brilliant fire, with wavy radiations. Copper filings give a greenish tint to flame; these of zinc, a fine blue color; the sulphuret of antimony gives a less greenish blue than zinc, but with much smoke; amber affords a yellow fire, as well as colophony, (rosin,) and common salt; but the last must be very dry. Lampblack produce a very red color with gunpowder, and a pink one with nitre in excess; it serves for making golden showers. When lightly mixed with gunpowder and put into cases, it throws out small stars resembling the rowel of a spur; this composition has hence been called spur fire. The yellow sand, or glistening mica, communicates to fireworks bolder radiations. Verdigris imparts a pale green; sulphate of copper and sal ammoniac give a palm-tree green. Camphor yields a very white flame and aromatic fumes, which masks the bad smell of other substances. Benzoin and storax are used also on account of their agreeable odor. Lycopodium burns with a rose color and a magnificent flame; but it is principally employed in theatres to represent lightning, or to charge the torch of a fury.

CLYDONICS.

At the last meeting of the Polytechnic Association the President, S. D. Tillman, read the following paper on the possible velocity of sound and other vibrations:—

Under this title, derived from the Greek, KLUDON, it is proposed to embrace those branches of Science which treat of Waves and Undulations; of Oscillations, Vibrations and Pulsations. By grouping, in this manner, manifestations of force through *to and fro* motions, more or less rapid, the student is enabled to view this class of reactions from a standpoint where comparative measurements and estimates greatly assist him in reaching and retaining correct conclusions.

This paper will be devoted to that subdivision of Clydonics which includes considerations regarding the relative action of the most common media of Light and Sound.

It is very difficult, if not impossible, to form a correct conception of the extreme attenuation and rapid motion of the ethereal medium, which is termed æth, to distinguish it from the ether of chemistry. In papers previously presented I have endeavored to show that all the distinct and apparently diverse effects known as Heat, Light and Actinism may be the result of wave motions of the same fluid varying in velocity. Bearing in mind the broad distinction between the normal movements of air waves and the transverse movements of æth waves, let us by gradual ascent upon the atmospheric ladder, so to speak, reach the dizzy hight at which rapidity of motion is apparently the rule, and rest the exception, in the wonderful economy of Nature.

The propagation of sound through air, having the temperature of the melting point of ice—the mercury of the barometer standing at 30 inches—is about 1,090 feet per second. Its velocity is directly as the square root of the elasticity and inversely as the square root of the density of the air. When the temperature is increased one degree on the Fahrenheit scale any gas is increased $\frac{1}{491}$ in bulk. The formula of Newton, with the correction of Laplace expressing the ratio of the specific heat of air at a constant volume, with its specific heat at a constant pressure, has been confirmed by actual measurements. In gases under the same pressure and of the same temperature the velocity of sound is inversely as the square root of the densities. Dulong produced tones from organ pipes by means of different gases, and found that sound was propagated in one second through Hydrogen 4,154 feet; through Carbonic Oxide, 1,105 feet; through Air, 1,093 feet; through Oxygen, 1,040 feet; through Carbonic acid, 857 feet. The density of Oxygen being sixteen times that of Hydrogen, it will be seen that the velocity of sound thus obtained in these gases corresponds very nearly with the calculated rate.

The elasticity of the atmosphere being directly as its pressure, the velocity of sound would be the same at all hights through air at the same temperature. The variations caused by decrease of heat in upward progress can be calculated from data gathered by Mr. Glaisher during balloon ascensions, to the hight of five miles. Without attempting to give even a near approximation toward the true hight of the atmosphere, which must have a definite boundary at that line where gravitation exactly counterbalances the repulsive force of its particles, attention is called to the following table showing its rarefaction, increasing in geometrical ratio with each ascent of 3·4 miles:—

	Times rarer.
At 17 miles it is.....	32
At 34 miles it is.....	1,024
At 51 miles it is.....	32,768
At 68 miles it is.....	1,048,576
At 85 miles it is.....	33,554,432
At 102 miles it is.....	1,073,741,824
At 119 miles it is.....	34,359,738,368
At 136 miles it is 1,099,511,627,776	

This possible attenuation of air will not excite surprise when we consider that a grain of gold may be so expanded as to be divided into 4,900 millions of parts perceptible with the microscope; but astonishment cannot be repressed upon calculating the velocity of sound in a fluid 13,000,000,000 times less dense than air thus expanded, provided its elasticity remains the same as at the earth's surface under the standard pressure and temperature. The square root of 1,098,209,000,000 is 1,048,000, which, multiplied by 12·386, the number of miles per minute at which sound moves through air, gives 12,980,528 miles as its velocity through such a medium; while the propagation of light through æth is only at the rate of 11,400,000 miles per minute.

Assuming that any energy generating wave motions in a fluid in consequence of its elasticity follows the same law, we now have the means of making a comparative estimate of the density of the æth directly enveloping our globe; and it may be stated, in general terms, that such æth does not exceed in density that a cubic inch of air would have were it expanded to 1,098,209,000,000 of cubic inches.

It will not be inferred from this view that the aim has been to reach

"The first of things, quintessence pure,"

for the elastic quality of æth involves the hypothesis of a still more subtle fluid. We have raised one curtain only to find another to be raised. As the unfathomed vaults of Heaven recede before the sweep of a more powerful refractor, and nebulæ resolved reveal nebulæ beyond, so the most diminutive germ that springs from the Creator's touch discloses, through the lens of higher power, new signs of more wonderful mechanism within. Each nucleus has its nuclei. Each entoblast is but the boundary of a microcosm; each particle, a galaxy of atoms, revolving in the all-pervading æth. Thus before every far-reaching human advance, circumference and center will forever retreat.

Homes for Workmen.

We are glad to find that the subject of homes in the country for laboring men who live in Boston is engaging more general public attention. As a matter of education, as a matter of health, or as a matter of morals, we conceive that it is a subject of the first importance to practical men.

In the city of Philadelphia a man may hire a pretty house for two hundred and fifty dollars, well finished and substantially built, with every facility for water arrangements, gas and the other conveniences of modern life, the whole built on a lot one hundred feet deep. Is there any reason why, because a man works in Boston, he should be unable to enjoy these conveniences which have become necessities, unless he pays twice or thrice the price for them paid by his comrades in Philalelphia?

The workman who lives in Worcester, Mass., sees his boys grow up strong, tall and hearty, not oppressed by school, work or other confinement. If he chooses he can cultivate the half acre or acre next his house, and provide his table with better vegetables than Mr. Crœsus or Mrs. Midas can buy in Faneuil Hall Market. When winter comes, he lays down his own pork for the winter. The year through he has eggs for his table if his wife and children choose. And he does not pay so much for his rent as the workman we have described in Philadelphia. In practice, indeed, he buys his own homestead, and knows what "real estate" means.

Now the Philadelphia workman and the Worcester workman both, very probably, live half an hour from their work. Every one can see that the Boston workman might, within half an hour of his work, have just the same advantages at the same price,—if the railroad companies and capitalists would take this matter in hand on a scale of magnitude sufficient to offer these facilities to many people at once. There is land enough within ten miles of Boston for such homes as we describe in Worcester. All that is needed is that the arrangements for a large munber of houses and gardens, at cheap rents, be made at one time at one place; for it is necessary that the morning and evening special trains shall be arranged to meet the specific working hours of the city.

Let any railroad company, or any combination of shareholders, build such a village of a hundred houses, as will give homes and gardens to a hundred families at rents not exceeding one hundred and fifty dollars. The accommodation given could be made palatial in comparison with the crowded tenements in the city for which the same families are now paying from two hundred and fifty to four hundred dollars. Let the trains to Boston be arranged so that the workmen may meet the requisitions of a day's work. What they will gain will be, first, a chance for the education of their children under the open sky, and with good air and food,—an opportunity which all the city missions, and ministries at large in the world cannot give them; second, an interest themselves in the direction of their own community, which the best man loses when he is one of a thousand huddled together in a crowded alley;—third, opportunities of health, exercise, and personal improvement which would make, in a generation, an entire change in the physical stamina of our laboring men.

[These suggestions from the Boston *Advertiser* are valuable as well as interesting. If there is anything that requires attention it is accommodation for the families of workingmen in habitations where the surroundings are not destructive of all moral feeling and social decency. The erection of tenement houses of a proper kind is necessary for the convenience of those who prefer to live in cities, but there are always large numbers of well-bred and educated men who would willingly go an hour's ride from their work if their little families could have the benefit of fresh air and country exercise.—EDS.

Working and Thinking.

It is a no less fatal error to despise labor when regulated by intellect, than to value it for its own sake. We are always in these days trying to separate the two: we want one man to be always thinking, and another to be always working, and we call one a gentleman and the other an operative; whereas *the workman ought often to be thinking, and the thinker often to be working; and both should be gentlemen* in the best sense. As it is, we make both ungentle, the one envying, the other despising his brother; and the mass of society is made up of morbid thinkers and miserable workers. Now it is only by labor that thought can be made healthy, and only by thought that labor can be made happy, and the professions should be liberal, and there should be less pride felt in peculiarity of employment, and more in excellence of achievement.—[Ruskin.

Solar Pump.

La Science Pour Tous gives an illustration of a pump to be operated by the sun's rays, erected at Saida, Algeria, by Mr. Deliancourt, the Commandant of the place. An airtight hollow box of sheet iron has its top painted black to absorb the sun's rays. A pipe leads from the well into the box one fourth the distance below the top, to which hight the box is filled with water. The discharge pipe leads out of the box near the bottom, and flap valves are provided so that when the air expands in the upper part of the box the water will be forced out by the discharge pipe, and when the air contracts, water will be drawn up into the box, from the well. Shades are provided to expose the blackened top of the box to the sun's rays, and then shelter it, with as frequent alternations as possible.

IN Russia, the first diamond was discovered in July, 1829, by Humboldt and Ross, when on their journey to Siberia, on the west side of the Uralian mountains, in the gold-washing establishments of Krestowosdwisheaski, belonging to Count Shcuwalow.

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POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening March 23, 1865, the President, S. D. Tillman, Esq., in the chair.

FORMING WOOD IN CURVES.

The formation of curved cases for pianos being mentioned,

Mr. Stetson remarked that Mr. Belfer, a manufacturer of very fine furniture in this city, acquired, in a very high degree, the art of forming wood in curves. The plan is to glue a number of sheets of veneers together, and press them while the glue is yet warm, in hot iron presses of the desired form. The several pieces are put together so that the grain will cross, thus rendering it impossible for the wood to split. On drying, the curve always increases, so it is necessary to make the mold nearer straight than it is desired to have the finished wood.

HEAVY ORDNANCE.

Mr. Norman Wiard remarked that he had occupied a good deal of the time of the Association in presenting his views in relation to large guns, and should like the opportunity to reply to some criticisms on his views recently published by Mr. Isaac Newton. It was well understood by the Association that the speaker contended that the most common cause of the bursting of heavy guns is the heat generated by the burning of the powder. When iron is heated it expands with a force equal to its resistance to compression—a force practically irresistable. The heat resulting from the combustion of gunpowder is never estimated at less than 5000°. When powder is burned in a cannon, the inner surface of the walls is highly heated, and this heat is conducted into the wall toward the exterior. If the gun is fired repeatedly in rapid succession, the heat accumulates within the wall at a distance of, say three or four inches, causing an expansion which ruptures the gun, the crack commencing at the interior surface. The speaker cited a number of facts in support of his position, among them the following:—

EXPLOSION OF A PILE HAMMER.

"Some years since I cast a pile hammer weighing four tuns. The man for whom it was cast arrived at my place just after the mold was filled, and wanted to take the hammer away that night. I told him that was impossible. He was in a great hurry, and arranged with two of the men to sit up with him all night to draw the sand away from the casting as it hardened, in order to cool it as rapidly as possible. The next day we hoisted it out and got it upon the deck of a canal boat, the deck being protected from the heat by two layers of brick. The man started off with his hammer, but before night he came back and ordered another one cast. It seems that the heat remaining in the casting set fire to the deck, and in throwing water on the fire a little fell upon the hammer; seeing that this hastened the cooling, the owner threw on more, when the casting burst with a report that was heard two miles. One half flew forward, killing a horse, and the other went towards the stern, falling thnough the bottom, and sinking the boat."

BURSTING OF A LARGE PLATE.

"In making the mold for my large cannon we cast a circular plate 10 feet in diameter, and 3 inches thick. To hasten the cooling we removed the cope from the mold, when the large surface of hot iron made the shop intolerably warm. To diminish the heat, the foreman threw sand upon the plate around the edge leaving the middle uncovered. This caused the middle to harden first, and the outside, cooling afterwards, was, of course, drawn by its contraction into a state of tension upon the interior mass.

"We had been at work upon this plate several days, drilling a series of holes through it near the edge, and had it on a drill press over a pit which communicated by a trench with the outer air. A very warm blast of wind passed over Trenton, and the next morning when I went to the shop the watchman said that the shop had been struck by lightning in the night. I went in and saw that the great plate had burst in two halves, one crashing inward among the machinery, and the other flying outward and falling into a pile of valuable castings.

"I suppose that the current of warm air had struck against the center of the plate, slightly expanding it, and thus increasing the tension of the rim sufficiently to overcome the tenacity of the metal. This diagram exhibits the form of the crack; when the pieces are in contact in the center they are considerably separated at the edges."

SPONTANEOUS BURSTING OF A GUN.

"At Pittsburgh I saw one of the 15-inch Rodman guns which had split spontaneously before it was finished. At the outside of the gun the crack was so wide that I inserted my fingers, while at the surface of the bore it was invisible, the parts being in contact.

"This gun was cast by Rodman's method, the casting being cooled by a current of water in the bore. This plan chills the metal about the bore first, and then, as the outer metal cools it shrinks upon that within, and is thus drawn into a state of tension. I suppose in the case of this split gun the tension was carried so far that it overcame the strength of the metal.

"This mode of casting puts the gun in a favorable condition to resist the pressure of the powder, but in the most unfavorable condition to encounter the principal cause of explosions, that is the expansion of the metal near the bore by heat. In fact one of these guns that had endured a shotted charge, was afterward burst in firing an unshotted salute. The metal is in a condition similar to that of the glass in Prince Rupert's drops."

EFFECT OF CAST IRON ON WROUGHT IRON.

In the course of his remarks Mr. Wiard said, "It is well known that a half-inch rod of the most fibrous iron, by being dipped endwise into a vessel of molten cast iron has its fiber entirely destroyed, while if it is dipped in sideways the fiber is not injured."

DEFECTS OF SOLID WROUGHT IRON GUNS.

"The contraction of the metal in cooling offers an insurmountable obstacle to the construction of cannon of large caliber by the process of forging solid. As the outside cools and hardens first it forms an unyielding hoop, and when the interior cools and shrinks it must be pulled asunder, forming fissures. These fissures are generally formed at the welds. Where the welds are across the piece as in the Ames gun, the fissures will run around the bore. I saw in Washington the wax mold of the bore of the Ames gun taken before it had ever been fired, and the grooves around the bore were as large as my finger."

HARDENING WROUGHT WITH CAST IRON.

Dr. Parmelee remarked that wrought iron may be case-hardened by dipping it in molten cast iron; horse shoes are hardened in this way in large quantities.

Water Pressure Engine.

These machines are coming into use wherever water can be had freely and at low price. At the late industrial fair held in San Francisco, Cal., the committee awarded the first premium for machines of this class to Messrs. Hansbrow & Redding. Their engine was 7 inches cylinder and 14 inch stroke, and is described as follows:—

"The principal feature in the invention consists in using water as an expansive agent which is accomplished by a beautiful and simple mechanical device, viz: the application of air chambers and compensating air valves at each end of the cylinder, imparting an elasticity to the water by that means and giving it a similar action in the steam engine; the compressed air also causes the discharge of the water at stated intervals after it has done its work; this arrangement allows of a much higher speed of piston than has before been obtained by engines of this kind.

"After a thorough investigation of the principles of this engine we find that as an economizer in the use of water it surpasses any known water wheel either turbine or rotary and we would recommend it in preference to any other water motor where clean water at a high elevation can be had.

ORANGES AND LEMONS IN CALIFORNIA.—The attempt to grow oranges and lemons in California is every year becoming more successful. The principal groves are at Los Angeles, where there are half a dozen men engaged in the business. Oranges are grown in other places in the State, but mainly in gardens and for private use. There were about 60,900 oranges and 30,000 lemons grown last year at Los Angeles. This year nearly 100,000 oranges and 40,000 lemons have been raised in that vicinity. The oranges grown this year are larger, and in every way better than last year's crop, and sold at the grove at three dollars per hundred. The largest growers are two Frenchmen at the Mission San Gabriel, whose crop last year amounted to about 25,000 oranges, besides a quantity of lemons.

EFFECT OF COAL ASHES ON WOOD ASHES.

At a recent meeting of the Farmers' Club a communication was read asking why it is that no soap can be made from the leachings of a mixture of wood and coal ashes, and the question gave rise to discussion, some raising doubts in regard to the fact, and others reading papers or making remarks in explanation.

A glance at Knapp's & Muspratt's tables of the analyses of coal ashes that have been made in various parts of the world, shows at once the extent to which the statement is true, and suggests the simple and only explanation.

Chemically considered, soap is a salt; it is a compound of an acid with an alkali. The two alkalies used for making soap are soda, and potash or potassa. There are also alkaline earths, as lime and magnesia, which will make soaps, though these soaps are of no value. Acids and alkalies have a strong affinity for each other. Every acid will combine with each of the alkalies, and these compounds are called salts.

The oils and fats from which soap is made are compounds of an acid with that peculiar substance glycerine, (or more strictly with the oxide of glyceril, of which glycerin is a hydrate.) The fat acids have a stronger affinity for the soda or potash than they have for glycerin, when, therefore, the fats are brought in contact with one of these strong alkalies, they are decomposed, the acid leaving the glycerine and combining with the soda or potash, and forming soap.

The fats usually employed produce with soda hard soap, and with potash soft soap. But with oils liquid soaps may be formed of any degree of fluidity. Wood ashes contain a large proportion of potash, and as this substance is soluble in water it is readily removed by the process of leaching. The question is do coal ashes contain any substance which will enter into combination with potash and form an insoluable compound that cannot be extracted by leaching, or a compound so permanent that it will not deliver up the potash when brought in contact with acid fats. Professor Johnson gives a table of analyses of nine samples of American coal, the following being about an average specimen:—

Silica	53·603
Alumina	36·687
Sesquioxide of iron	5·590
Lime	2·857
Magnesia	1·076
Oxide of manganese	0·186
Loss per cent	0·001
	100·000

In the other samples no other substances but these were found, and it will be seen that none of these would enter into combination with potash to prevent it from making soap. All of the nine samples were from localities east of the Alleghanies.

Muspratt gives a table of analyses of Scotch and Welsh coals in which all the samples showed a small proportion of sulphuric acid, ranging from 2·22 to 8·38 per cent. They also contain sufficient lime to form sulphate of lime with the sulphuric acid. This sulphate of lime would, doubtless, under proper conditions enter into combination with the potash forming a double sulphate of lime and potash. In this way the extraction of the potash might be obstructed. Or if the lime were carried into the mixture with the fat, a lime soap wold be formed which would be insoluble and worthless.

We therefore conclude that a mixture of ashes of Welsh and Scotch coals, if in sufficient proportion, might destroy the value of wood ashes for soap making, but that ashes of American coal from the Atlantic slope would have no effect whatever.

In examining more than 1100 analyses of coals from various parts of the world, we find no analysis

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of the ashes of our Western bituminous coals, and only one of the ashes of English coals. We are therefore unable to say what effect they would have on wood ashes.

FARMERS' CLUB.

At the meeting on Tuesday, March 28th, the time was principally occupied in discussing a fruit-preserving house, invented by Prof. Benjamin M. Nyce, A. M., of Cleveland, Ohio, Prof. Nyce having come to this city to explain his invention by express invitation of the Club.

This house consists of two apartments, one above the other. The upper one contains ice, put in every winter, in depth usually five to six feet. This is separated from the fruit room below it by a floor of galvanized iron, the sheets of which are closely riveted and soldered, so as to be perfectly water-tight. The walls are made of two casings of sheet iron, 3½ feet apart. The edges of these sheets are painted and closely nailed to upright studding, the intervening space being filled with chaff, sawdust, or short shavings, or other non-conducting substances. The floor of the fruit room is also made of galvanized iron. Below this are placed shavings, three feet thick, on a coating of tar and pitch, spread one inch thick upon the ground, to prevent the entrance of moisture. One or more wind-wheels are placed above the roof, geared to fans in the fruit rooms. On the floor of the fruit room was spread formerly, in its dry state, the chloride of calcium, a substance which has great power of absorbing moisture; but now the waste bittern, from salt works (absolutely costless,) after being dried, is found to be equally as efficient as the former chloride.

The inventor says:—

"The elements of a complete preserving atmosphere are, coldness, dryness, purity, equality of temperature, at all times: and in every part, absence of light, and if possible, the exclusion of the great agent of decomposition, the oxygen of the air. This plan secures all these elements in great perfection. The thermometer shows a uniform temperature of 34° in all parts of the room, and is found not to vary a single degree from 34° even from April till October.

"Dryness is its leading patentable feature. Vapor is constantly given off from different kinds of fruit, amounting usually to at least half a gallon of water from one hundred bushels, per week. This vapor is taken up by the absorbent, which is spread over the floor of the fruit room. It is made to run out in tubes to the outside, once in about every month. It is then dried in large pans, of sheet iron, and returned to the house in the dried state as before. The same substance is thus used twenty or thirty times. The air in a room so completely confined, after the fruit is chilled down to 34°, becomes very still. The fans are needed to give circulation to the air, and bring the moisture arising from the fruit in contact with the absorbent, to be taken up by it.

"In the gradual ripening of fruit, hydrogen and carbon are constantly given off; the former unites with the oxygen of the air, and forms water; the latter, carbonic acid.

"This process in any confined vessel filled with fruit, consumes all the oxygen, especially if the fruit be ripe, and the air warm, in about 48 hours. The rooms of this house are gas tight, and when filled with fruit, if closed up for two days, a candle goes out in them almost instantly.

"The sources of profit are pears and grapes, kept during the fall and winter months; apples until the months of May, June and July; lemons, oranges, pine-apples, through the summer season; canned fruit, put up in six or ten gallon cans, and retailed out by measure; the fruit when taken from the cans, which are used successively for a number of years, is kept fresh in the house in the open vessel for a number of weeks. Hence this fruit may be sold by measure without loss in the summer months. Oysters, butter, and eggs are also sources of profit.

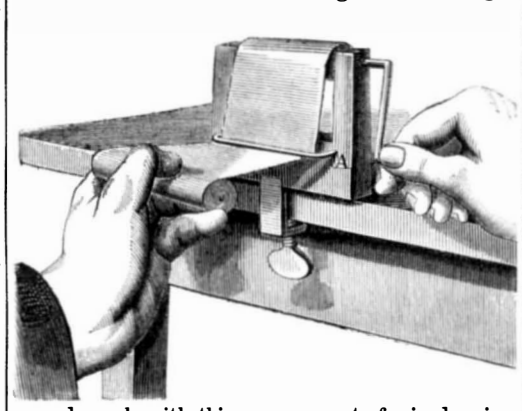
"All fruit should be in the house when tree-ripe; that is as soon as it has received all the virtue the tree, or the vine can impart to it. 'Rub an unripe, or green, apple or pear on a grater, to a pulp; wash this with cold water on a sieve,—the turbid liquid which passes through, deposits a fine flour of starch of which not even a trace can be detected in the ripe fruit. This after ripening, as it is called, is purely a chemical process. It is the starch being transformed into sugar, The more starch the unripe fruit contains, the sweeter does it become when ripe.' "—*Liebig.*

Mr. Bartlett remarked that the phraseology in which the formation of water and carbonic acid is stated is liable to be misconstrued. If hydrogen and carbon issue from the fruit as uncombined elements, they will enter into combination with the free oxygen of the air only at a burning temperature—a red heat.

Dr. Percy stated that he has gone through a long series of experiments to determine whether fruit could be preserved in an atmosphere of pure nitrogen. The fruit was placed in glass jars which were then filled with nitrogen gas chemically pure. The jars were placed in a cellar, the temperature being probably 50° or 55°. Apples kept very well 18 months; grapes and pears were also preserved satisfactorily, but peaches decayed very soon. Meats became slimy and acquired a bad taste in the course of a few days.

SANBORN'S BANDAGE ROLLER.

It is necessary that bandages, such as surgeons use in operations, should be rolled up tightly in a compact form, so that they will not unwind or get loose in the center; for this purpose it is usual to employ a common wooden roller set in a frame and provided with a crank. It is difficult to get the bandages



wound evenly with this arrangement, for in drawing the cloth the operation of turning is impeded. In this engraving a neat little device is shown attached to the common frame, so that by the use of it any desired tension can be given the bandage, and the same wound evenly and regularly from end to end. This attachment is merely the wire guard, A, through which the bandage is passed and held in the manner shown; the desired end is thus attained and the work done in a superior manner.

This is the invention of J. F. Sanborn, of Tabor, Iowa, who desires that it may be freely used by all.

Strawberry Culture.

Mr. C. G. Cotting writes to the Woodstock *Sentinel* that he makes new beds of strawberries productive the first year by the following plan:—

"You are aware that many of your readers have strawberry beds, and neglect the runners until they cover the bed so thick that they almost cease bearing. I have done the same thing. I wish to tell all such how to make a new bed to bear this year. Early in the spring, as the ground is settled, and in good working order prepare a new bed as near the old one as may be, by plowing or spading it well, and hoe or rake until it is in good condition for any vegetable crop. Mark off the new bed into rows of three feet apart lengthwise, and two feet apart crosswise. In each corner dig a hole twelve inches long by eight wide, and three inches deep; then, two feet from the edge of the old bed, draw a line the whole length of the bed; then another line parallel to it, two feet further on; then take a butcher knife, or any other instrument which will answer the same purpose, and cut three or four inches deep, following the line the length of the bed; then cut through the two feet strip again in the same manner, eight inches from the line, which will leave two feet strip between the lines in three strips, each eight inches wide, then cut across the three strips once in twelve inches, which forms it into parts eight and twelve inches. Then run a spade under the plants three inches deep, and take them up and lay them carefully without breaking into the holes first made in the new bed, press them down firmly, smooth the dirt around the plants thus placed, pull out the grass and weeds, if any. Each hill so taken up, will contain from four to eight plants, and the roots not having been disturbed, will bear this year, just as well as if they had not been moved, and far better than if left in the old bed without trimming. Wheel in good rich soil and fill up the trenches made in the old bed, thin out and clean the remaining plants; and depend upon it, you will have a good crop of berries from both the old and new bed. I have tried it.

New Petroleum Engine.

Mr. F. H. Wenham, ot Clapham, has patented an invention, which consists of two pistons contained in a cylinder with open ends. The first piston works a crank by means of a connecting rod, the second is disconnected. During the revolution of the crank the second piston follows close to the first by atmospheric pressure until near the termination of the up stroke. They then separate for a short distance, at which time a mixture of gas and an explosive vapor is drawn in between them. When the first piston arrives at the end of the stroke it uncovers a small touch-hole, a flame is drawn in through the side of the cylinder, the gases take fire, and by explosion drive the second piston to the opposite end of the cylinder; here is fixed a cross-bar, through which the flat-rod of the second piston passes, this is now instantly held fast by two wedges driven into the cross-bar against the flat sides of the rod; this, and the wedges may be grooved to increase the grip. A vacuum is formed between the pistons, and the one connected with the crank in approaching the other by atmospheric pressure causes the revolution of the shaft. The piston before again coming into contact drives the products of combustion from between them through an outlet valve in the side of the cylinder. The loose piston is again released by withdrawing the wedges, and follows after the other for the succeeding stroke. The next improvement is for a means of ingiting the gaseous mixture. A gas-jet pours directly into the touch-hole in the side of the cylinder. Surrounding the flame of the jet there is a platinum coil to retain heat. There is a similar arrangement round the touch-hole, and both coils remain red-hot whilst the engine is at work, and prevent the flame from being blown out by the force of the explosion through the touch-hole. He gives increased pressure and intensity to the gas by means of a small pump or bellows. A further improvement consists in passing the gas or air through naphtha, petroleum oil, or other volatile liquids, to obtain an inflammable vapor. The receptacle containing the liquid may be heated to assist vaporization.

An English Cure for Drunkenness.

There is a prescription in use in England for the cure of drunkenness, by which thousands are said to have been assisted in recovering themselves. The receipt came into notoriety through the efforts of John Vine Hall, commander of the Great Eastern steamship. He had fallen into such habitual drunkenness, that his most earnest efforts to reclaim himself proved unavailing. At length he sought the advice of an eminent physician who gave him a prescription which he followed faithfully for seven months, and at the end of that time had lost all desire for liquor, although he had been for many years led captive by a most debasing appetite. The receipt, which he afterwards published, and by which so many other drunkards have been assisted to reform, is as follows: Sulphate of iron, five grains; magnesia, ten grains; peppermint water, eleven drachms; spirit of nutmeg, one drachm; twice a day. This preparation acts as a tonic and stimulant, and so partially supplies the place of the accustomed liquor, and prevents that absolute physical and moral prostration that follows a sudden breaking off from the use of stimulating drinks.

The Blakely Ordnance Company.

The London *Mechanics' Magazine* gives a description of a very extensive establishment now being erected on the banks of the Thames below London, for the manufacture of Blakely guns. The works will cover 14 acres; the self-acting lathes will each occupy 70 feet, and be capable of turning guns of 50 tuns weight and 20 feet length. These guns had been used to a considerable extent by the rebels, and a number of them have been captured by our forces.

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Correspondence

Kerosene as a Substitute for Fish Oil in Tanning.

MESSRS. EDITORS:—The difficulty and danger involved in procuring the vast number of codfish requisite to satisfy the commercial demand, and the labor of expressing the oil itself, must always make cod liver oil an expensive article. Even the simplest method, which is to pile the livers in great tubs, and collect the oil released from the animal tissue by slow putrefaction, requires months for its completion. Moreover, the fishermen meet with very various success in different years, and the price of fish-oil is in consequence subject to considerable fluctuation. In time of war, the fisheries are altogether interrupted, and in view of the possibility of a quarrel between this country and England, this fact becomes of grave importance. It is not then difficult to see how valuable would be some good substitute for fish-oil; coal-oil prepared by a certain process is said to be such an one, and it is the purpose of this article to consider the advantages and disadvantages of its use in that department of industry where fish-oil is principally employed, that is, in the dressing of leather.

When the hides are brought from the tannery, the first operation is to shave off the loose fleshy matter which has still clung to the inner surface of the hide. Then the outside is scoured to remove the exhausted tannin from the leather, when the hides are fit for oiling. Equal parts of oil and tallow are mixed together to make it what is called *dubbin*. This is rubbed on the flesh surface of the hide, while upon its outside they pour pure oil. Some of the tallow in the dubbin seems to be dissolved by the oil, and being carried into the leather gives it more firmness and body. When the hides have been dried, a white solid fatty substance is found where the dubbin was, resembling stearine. This is sold to candle makers and makes an inferior kind of candle. Now it is said that the tallow will dissolve to a greater extent in coal-oil than in fish-oil, and should therefore be regarded as the preferable material for dubbin. In some cases the leather prepared from mineral oil does wear excellently, and has given perfect satisfaction; in many others it has worn so badly that a large number of persons are prejudiced against leather so prepared. While some remains soft and pliable other leather dressed with kerosene grows hard and stiff, and for this reason firemen who would find their labor greatly increased and the flow of water greatly retarded, if their hose were not yielding, refuse to have it dressed in coal oil.

The difference in pliability cannot be ascribed to a difference in the leather used, because two pieces may be cut from the same hide, and the one prepared with cod-liver oil will be soft, the other with petroleum, very often will be hard. And the same facts are true whether the leather was dressed in cold or warm weather.

The process by which coal-oil is made suitable for these uses I do not know, and cannot therefore decide whether the leather manufacturers are correct in their opinion. But I find that they attribute the various results arrived at in employing coal-oil to some imperfection in the process employed to fit the crude oil for tanners' use.

The expense of coal-oil is but one-half that of cod-liver-oil, and when the immense amount of the latter that is consumed annually by tanners is taken into consideration, the great importance of settling this disputed point will be evident to all. I write for information and would be glad if some one who could speak from long experience would make some answer to the above. ALBERT R. LEEDS.

328 Walnut St., March 27, 1865.

[We have no doubt that some of our readers will, for mutual advantage, be kind enough to forward their experience.—EDS.

Pyroligneous Acid in Chimneys.

MESSRS. EDITORS:—The suggestions of W. O. Glover, in regard to the remedy for pyroligneous acid in chimneys are good so far as they go, but the Stuart cook stove is made to consume almost no fuel, and the heat being nearly all exhausted in the room, the little that escapes through the pipe and chimney is overcome, and the moist portion of the smoke condensed by the cold air before it reaches the top of the chimney. There is no remedy but to burn wood enough to heat the air in the chimney. I have demonstrated this the past winter beyond the possibility of a mistake.

Last fall I put up a sheet iron parlor stove called the Keystone, manufactured by Messrs. Cox & Church, Troy, N. Y., which, by its peculiar construction, gives nearly double the heat with very little more than half the fuel used by any other stove of equal size; the consequence is that a drum in the upper room through which the escaping heat and smoke pass is rendered almost useless, there being scarcely any perceptible heat about it; four feet higher the acid runs out in all directions; by reversing the laps of the pipe the acid would run down on the inside until it reaches a point where the heat would evaporate it. In warm weather pyroligneous acid will not trouble any one. N. SMITH.

Delphi, Carroll Co., Ind.

The Principles of Flying.

MESSRS. EDITORS:—On page 137, No. 9, Vol. XI. of your valuable paper is the following;—"How much power would have to be expended in beating the air in order to raise a given weight we have not the data for determining, but it is probable that some of our readers would easily ascertain." An answer never having appeared it would be interesting to know if the following could be correctly applied. The implement used is assumed to be a spiral fan say with six blades, having together the same area as a circle of the same diameter as the fan. Those blades have a certain pitch. Then say: As radius is to the cosine of the angle of pitch, so is the area to surface of resistance. Example:—Diameter of fan 7·5 feet, area 44·18 square feet, pitch 45°; then as 1:0·7071:: 44·18:31·24 square feet, then say: as radius is to the sine of the angle of pitch, so is the semidiameter of the fan to the distance the fan will bodily travel in one quarter revolution, or as 1:0·7071::2·75:2·64; this multiplied by 4 gives 10·56 feet in one revolution or 500 revolutions in one mile. Now assuming the fan were run those 500 revolutions in one minute, or at the rate of 60 miles an hour, it would exert a force of 562·32 pounds, because at 60 miles an hour velocity the fan has to overcome a resistence of 18 lbs. per square foot, and there being 31·24 square feet surface of resistance in the fan, it follows that 31·24 × 18=562·32 pounds is the force it exerts, and consequently will take that and a little more to overcome friction, to run at the same speed. Any other dimensions will give the same results in proportion.

CHAS. PARTENSCKY.

Oakland, Alameda Co. Cal., Feb. 19, 1865.

The Curious Action of a Glass Rod.

MESSRS. EDITORS:—The "curious action of a glass rod," described in your last number, may be explained, it seems to me, in this wise:—The action of fire on the rod would cause that side of the rod toward it to expand, and the rod in consequence would bow out toward the fire until the gravity of that part would cause it to fall—thus producing a rotary motion toward the fire. The same would happen, of course, if the rod were inclined—the direction of the rotation depending on the direction of the inclination. If the rod be placed on a glass or metal plate in front of a fire, the heat communicated from the plate will cause the ends to rise from it, while that from the fire will cause them to incline in the opposite direction from the fire, and falling will create a rolling motion from the fire.

WM. H. BROWN.

Worcester, Mass., March 11, 1865.

To Preserve Maple Sirup.

MESSRS. EDITORS:—The SCIENTIFIC AMERICAN of March 25, clips from a cotemporary a plan for causing maple sirup to retain its delicious flavor a length of time. As many are inquiring, at this season of the year, for the most efficacious means of accomplishing this desirable result, allow me to suggest an economical and expeditious method which wife has tried several years with invariable success. It is simply this:—Having cleansed some old champagne or sherry bottles, fill with sirup to within three inches of their mouths, and force in each mouth a lock of dry cotton. Stand them in a dry, cool place. The cotton cork allows the gases of fermentation freely to escape, and at the same time offers a sufficient barrier to the external air. All true lovers of buckwheat cakes with maple sirup should not fail to try this most simple and sure plan. A.

New York.

Pleased with Prompt Action.

MESSRS. EDITORS:—We are in receipt of the letters patent on our Sand-paper Holder, and also one copy of the SCIENTIFIC AMERICAN, for which, and for the prompt and efficient manner in which you have conducted our business with the Patent Office, please accept our thanks. We shall most certainly recommend your agency to our friends, as we are convinced that it has many advantages over any other. We expect to dispose of the entire right of our Holder to parties in Boston and if successful shall immediately place another case in your hands.

J. & N. W. REDDING.
Box 157, Charlestown, P. O.

Boston, March 14, 1864.

[The Messrs. Redding's invention is intended to hold sand and emery paper firmly while applied to work, much being lost at the present time from getting torn for want of a suitable holder.—EDS.

Tubular Boilers and Scale.

[For the Scientific American.]

Certain engineers argue that Cornish boilers make more steam than tubulars, and a case is cited of one in Paterson that would not make steam, and a new boiler was purchased. On overhauling the old boiler it was discovered that the spaces between the tubes were filled with scale, and the water did not reach them, hence no steam could be made. Now, I affirm that the cost of the new boiler might have been saved, together with the fuel wasted in trying to make steam through this non-conducting substance (at an expense of about 75 cents weekly) by using "Winans' Incrustation Powder"—long advertised in the SCIENTIFIC AMERICAN. There are many evidences of its successful operation. * * *

Aniline Black.

In our last number was a short paragraph in relation to aniline black. We now have on our table a sample of the sacharate of aniline used for the black dye, which was sent us by Mr. A. Reppelman, of No. 168 Fulton street, in this city, and importer of dyes from Germany. In the instructions for using this color the manufacturer says:—

"The aniline black is not a ready-made dye, but it forms in the fiber during the dying or printing process. It has been applied successfully, however, only in printing. It consists of saccharate of aniline, which is mixed with starch, gum tragacanth, sulphide of copper, chlorate of potash, dry chloride of calcium and sal ammoniac. The proportion in which the above-named ingredients are used is as follows: solution of starch in water, 2 quarts; solution of tragacanth, 1 quart; solution of roasted starch, 1 quart. After boiling this mixture it is divided in two parts. To one part add: sulphide of copper, 4·5 ounces; chlorate of potash, 4·5 ounces. To the other part add: dry chloride of calcium, 9 ounces; saccharate of aniline, 12 ounces; sal ammoniac, 2·8 ounces. Mix both compositions cold, and use for printing in the usual manner. After printing, the fabric is suspended in a room heated to 80 or 100 degrees, and after twenty-four or forty-eight hours at the utmost the color becomes black and fixed, so that it will stand washing.

Lost Patents Revived.

We are now prepared to attend to the renewal of applications for patents under the act of March 3, 1865, which, in default of payment of the balance fee within the six months specified, have not been issued. There is a large number of inventors who, by this omission, would have lost their cases but for this new act. They ought to speedily avail themselves of this opportunity, and we are prepared to advise with them and give all necessary instructions.

THE TREATY OAK.—We are indebted to Mr. Morell Clark, of Castalia, Iowa, for a sample of that famous oak under which Gen. Grant received the terms of capitulation of Gen. Pemberton and his army at Vicksburg, July 4, 1863

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Apparatus for Raising Oil and other Liquids from Deep Wells.—This invention has for its object to raise oil and other liquids from deep wells, and it consists in the use, within a well of an alternate plenum and vacuum of air or gas, produced by an air pump or other equivalent means, the said plenum and vacuum being applied by means of a suitable conducting pipe which is passed down into the well, either within or without the well tube, in connection with valves and chambers, for the passage into the well tube of the oil or other liquids to be raised. F. S. Pease, of Buffalo, N. Y., is the inventor.

Hand Mowing Machine.—This invention consists in a novel construction and arrangement of the sickle driving mechanism, whereby the gearing is fully covered and protected, a rapid motion of the sickle obtained by a very compact arrangement of parts, and the device placed under the complete control of the operator. These machines are made of various sizes to cut from ten inches to four feet in width. G. W. Jennings, of Boston, Mass., is the inventor.

Mouth-piece for Cigars.—As cigars are ordinarily made, considerable time is consumed in forming what is termed the "head," the portion or end which the smoker holds in his mouth. This head or end requires to be nicely rounded and pasted to prevent the wrapper from unwinding and with all the trouble and time expended in forming it, it is the only portion of the cigar not used or smoked. This invention consists in dispensing entirely with the tobacco head and substituting therefor one constructed of wood or other suitable material so applied as to effect a saving both in tobacco and the labor of manufacture, and, at the same time, produce a more desirable cigar, as the head or end will not be affected by chewing the same with the teeth, as is more or less the case in smoking the ordinary cigars. Jonathan Ball, of Elmira, N. Y., is the inventor.

Universal Timepiece.—The object of this invention is to produce a clock or watch which can be readily adjusted to indicate by the ordinary hands the correct or mean time for each of the places marked thereon, and which by means of a supplementary hand will show simultaneously the local time for all the places marked on the dial of the clock without calculation and mathematically correct. The invention consists in the employment or use of two or more compound or double circles on the dial of the clock or watch, the two parts of each circle containing respectively the figures for the hour and minute hands calculated and arranged to correspond with the longitude of the places marked on said circles in such a manner that the ordinary hands of the clock or watch are allowed to keep the accurate time of different localities; also in making the circles of different colors to aid the eye in tracing any given circle to any portion of the dial; further, in the use of an adjustable supplementary minute hand in such a manner that said adjustable dial can be arranged to correspond with the local time of any circle, and at the same time the supplementary hand will give the local time of any other place marked on any or all the circles; also in so constructing the supplementary minute hand that the same can be readily turned or adjusted without interfering with the ordinary hands or with the movement of the timepiece; finally in placing upon the different circles the names of other places beside those for which the circles are calculated, together with the variations of such additional places from the circle on which they are marked, in such a manner that by a slight addition or subtraction the local time of any of the places marked on the various circles can be ascertained. A. W. Hall, New York City, is the inventor.

Clothes Dryer.—This invention consists in the combination with a bracket containing a series of radiating folding arms of a supporter arranged either to be hung upon a pair of nails or to be secured to a shelf by a screw, and provided with a tenon which fits into a corresponding mortise or socket in the bracket with the radiating arms in such a manner that said bracket can be readily attached to and removed from either of the supporters, and the supporters can be conveniently secured at any desirable spot in or about a room. The radiating arms are connected to the bracket by loops or pivots in such a manner that the same when folded are close together from end to end, and when spread they afford an extensive hanging room for the clothes to be dried. John H. Doughty, of New York City, is the inventor.

Placer Mining.—This invention consists in an improvement in the process of mining commonly called placer mining, or, in other words, that mode of mining for precious metals in the earlier stages of which auriferous or other earths are washed and the precious metals separated by means of water. This method of mining has hitherto been successfully pursued only where water is abundant, or has been abundantly supplied by flumes, canals, and other hydraulic works. In all such works, previous to this invention, the source or sources of water supply were required to be above the level of the mine, so that a fall of water could be obtained and the earth be disintegrated by the mechanical force of the falling stream or streams. Such sources of water supply are not always to be found, and many of those which are available are not ever-running, being in some cases derived from rainy seasons or from melting snow. This is very extensively the case in large mining districts in the United States, as in California, the territory of Idaho and other regions. The rich placer mines of Idaho, for this reason, can only be worked about three months in a year. This invention is designed to enable miners to work mines of this character throughout the year without any interruption save from inclement weather of such severity as would freeze up water and make out-door operations impossible. Cornelius H. Smith, Rock Island, Ill., is the inventor.

Machine for Splitting Wood.—This invention consists in the use in machines for splitting wood of a four-winged knife, the wings of which radiate from a common center, in combination with a suitable conductor, through which the blocks descend by their own gravity, in such a manner that by the action of said knife the blocks are gradually cut up in three or four-sided pieces of a convenient size for burning, and of such a shape that they can be conveniently handled. The invention consists also in the application of a feeder composed of two reciprocating toothed bars, in combination with the knife, in such a manner that when the knife is thrust forward, whereby the split portion of the wood in the conductor is separated from that which has to be split, the feeder is drawn up over the edge of the lowest pieces in the conductor, and as the knife goes back each feeder descends and pushes out one layer of split pieces, allowing the blocks to descend sufficiently far for a fresh cut. John Henry Hildebrandt, Brooklyn, E. D., N. Y., is the inventor.

Ice Sandal.—This invention consists in an ice sandal made in two parts which are connected by a slotted plate and spring bars in such a manner that it can be lengthened in order to attach it to a boot or shoe and that it will be kept in place by small caps in front and heel pin behind. The sandal is perforated with a series of slots through which the creeper points pass and said points are secured to bars which can be turned in their sockets in such a manner that the points will either project below the bottom surface of the sandal when the same is to be used on ice, or drawn in beyond said bottom surface, if the person wearing the sandal enters a building or passes to some place where the points would produce injurious results. Said creeper bars are adjusted by cords and buttons moving in segmental slots, and they are locked in the desired position by a segmental stop which is turned up when the creeper points are drawn in and which is turned down when the creeper points are turned out. Edward Fitzki, Philadelphia, Pa., is the inventor.

The Rebel Patent Office.

The report made by the Commissioner of Patents of the Rebel States shows the receipts of his office for 1864 to be $27,192 32; expenditures, $9,896 22. Forty-two patents were granted during the year for useful inventions.

A CO-OPERATIVE machine shop in East Boston is just going into operation, the first job being a locomotive.

Steel Girder Bridge.

An English engineer (Mr. Worthington) has lately constructed a swing bridge for carrying a railway over the Sankey canal, in which the girders are made of Bessemer steel plates. The object of using steel instead of wrought iron was to reduce the weight of the girders. The girders are four in number, about fifty-six feet long, with bearings varying form thirty to forty feet, and two feet deep. They were manufactured from steel plates; and were tested with loads of a ton to the foot, or more than double the weight which they could possibly be called upon to bear. The deflection varied from 1-4 inch to an inch, according to the length of the girder, and there was no permanent set on removal of the testing load. The plates used varied fron 1-2 in. to 7-16 in. in thickness; and the average tensile strength of a considerable number of plates tested was upwards of thirty-six tuns to a square inch. The weight of the girders was about 5-6ths of the weight which they would have been if wrought iron had been used. Mr. Worthington has a piece of cast iron lately taken out of the Sankey canal. Its exterior, from one-eighth to a quarter of an inch in depth, was so soft as to be easily cut with a dull knife. From the form of the casting he thought it very probable that it had not been in the canal more than five or six years. He stated that the water of the canal was strongly impregnated with liquids discharged from alkali works.

MARKET FOR THE MONTH.

The remarkable feature of the market during the month of March is the extraordinary decline in gold, and, of course, in other articles. The lowest point reached by this general standard of values was 147½, from which it has rallied to 154. The decline in the leading staples is shown by the following table:—

	Price Feb. 22.	Price March 28.
Coal (Anth.) ₩ 2,000 lb	$14 00	$13 00 @13 50
Coffee (Java) ₩ lb	47 @ 48	33 @ 35
Copper (Am. Ingot) ₩ lb	44 @ 45	34 @ 36
Cotton (middling) ₩ lb	83 @ 84	50
Flour (State) ₩ bbl	$9 80 @10 40	$9 25 @ 9 75
Wheat ₩ bush	2 50 @ 2 80	2 25 @ 2 50
Hay ₩ 100 lb	1 70	1 60 @ 1 70
Hemp (Am. drs'd) ₩ tun	320 00@390 00	275 00@300 00
Hides (city slaughter) ₩ lb	13 @ 13½	7½@ 9
India-rubber ₩ lb	72 @ 1 15	65 @ 1 05
Lead (Am.) ₩ 100 lb	13 00	9 75 @10 00
Nails ₩ 100 lb	8 50	7 50
Petroleum (crude) ₩ gal	45	33
Beef (mess) ₩ bbl	$18 00 @24 00	13 00 @21 00
Saltpeter ₩ lb	30	28
Steel (Am. cast) ₩ lb	19 @ 34	15 @ 27
Sugar (brown) ₩ lb	15 @ 20	9½@ 14½
Wool (American Saxony fleece) ₩ lb	90 @ 1 10	75 @ 85
Zinc ₩ lb	18 @ 18½	14 @ 15
Gold	2 01	1 54

SPECIAL NOTICES.

FRED. P. DIMPFEL, Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 1st day of July, 1851, for an improvement in steam engines.

Parties wishing to oppose the above extension must appear and show cause on the 12th day of June next, at 12 o'clock, M., when the petition will be heard.

LAWRENCE MYERS, Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 24th day of June, 1851, and reissued to him on the 24th day of March, 1865, for an improvement in railroad cars.

Parties wishing to oppose the above extension must appear and show cause on the 5th day of June next, at 12 o'clock, M., when the petition will be heard.

Compliment to Commissioner Holloway.

The clerks and employees of the Patent Office have presented Hon. D. P. Holloway, Commissioner of Patents, with a handsome album containing their photographs, some 100 in number. The occasion was the fourth anniversary of Mr. Holloway's control of that Department, and his associates took this method of expressing their appreciation of the uniform kindness they had received at his hands, and their respect for him as an officer and a gentleman.

IT is reported that an ingenious clockmaker of Versailles has invented a clock, no larger than the ordinary instruments, which will go for a year, or indeed for a much longer time. The internal mechanism is not altered, but the pendulum is replaced by a horizontal lever, which acts on a twist of elastic wire suspended vertically.

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Ventilating Horse Cover.

"A merciful man is merciful to his beast," says the proverb, and of all domestic animals the last one to be neglected is the horse. Many persons thoughtlessly expose them to inclement weather, when a little forethought and small expenditure would have saved the services of a veterinary surgeon and the animal would have been in condition for use instead of being laid up in ordinary like a naval vessel under repair.

The horse cover here illustrated is not only water-proof, but is a great improvement on common water-proof blankets. The latter are not desirable and are regarded unfavorably by many persons owning horses. It is asserted correctly that being of a close compact texture, they prevent the natural exhalations of the body from passing off, so that the horse, after standing a while, is drenched in his own perspiration, thus superinducing disease, and in all cases making him uncomfortable and restive.

The improvements in this water-proof blanket are such as to render it self-ventilating and at the same time entirely impervious to moisture. It is constructed on a rule that works both ways, for while it allows water to escape, in the form of vapor, it prevents water in the form of rain or snow from reaching the animal. By referring to the principal engraving, the reader will see that a number of small loopholes, A, are constructed on the top of the blanket. These loopholes cover apertures below, as in Fig. 2, so that the perspiration exuded from the beast can readily escape without leaving so much as a crevice open for rain to enter. This is the principal feature, and its simplicity and utility are apparent at a glance. The main parts of the horse which perspire are those covered by the apertures, and on the flanks —from the latter the vapor readily descends and escapes at the openings beforementioned. The blanket is provided with straps and fastenings so that it can be neatly adjusted to horses of all sizes.

The invention was patented through the Scientific American Patent Agency on the 11th of October, 1864, by E. L. Perry, of New York, for further information address him at 153 Broadway, New York.

Fig. 1.

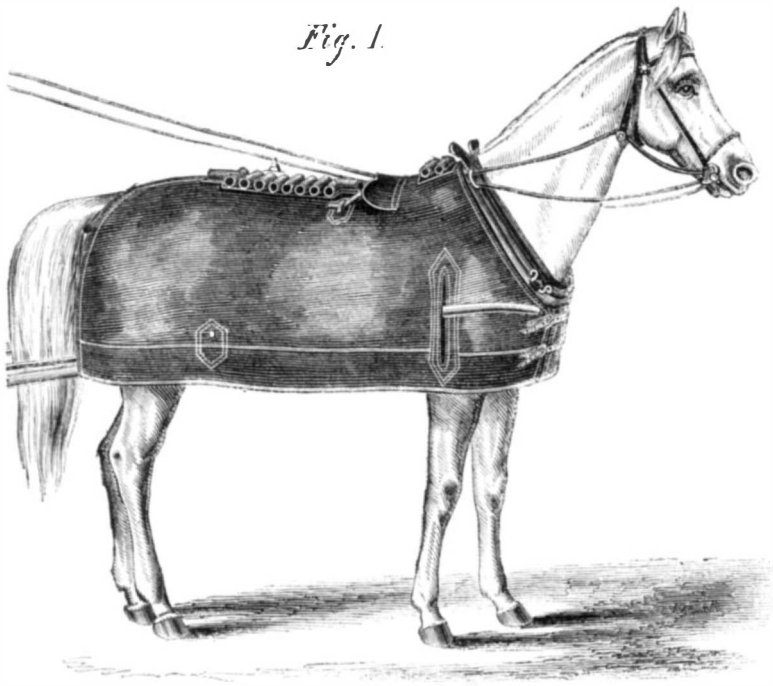


Fig. 2.

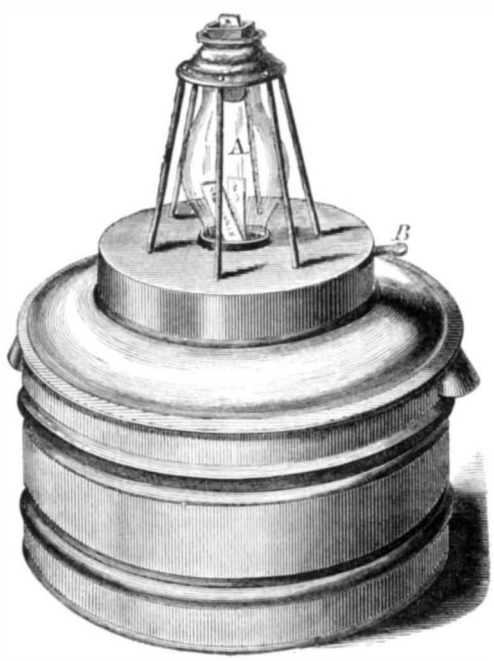
PERRY'S VENTILATING HORSE COVER.

Great Military Combinations.

The great plans of Lieut.-Gen. Grant, commanding our armies, are more clearly developed. We has exhibited a most heroic and enduring patience while each detail was being executed by his able lieutenants, not the least of whom is Gen. Sherman, and now is about to reap the reward of his well-planned combinations. He has out-maneuvered Lee in this the final stragetic combination, and has compelled him to commit the fatal error of defending his capital while its military supports were falling one by one around him. He has hemmed his adversary up in the State of Virginia, and will compel him there to fight or surrender. He has caused Sherman to sweep from Atlanta to Savannah and thence through South Carolina into the heart of the Old North State in such a manner as to penetrate the very vitals of the rebellion. Provident to a degree he has provided Sherman with a base by the timely capture of Wilmington, and enabled him to form a junction with the victorious army of Schofield, under circumstances which were in the highest degree encouraging to the gallant men composing his army. He, at a timely moment, dispatched Sheridan on a raid upon the enemy's channel of supply, and so thoroughly was the work done that Richmond was thrown into a panic, and fears for its safety were seriously entertained. He brought Sheridan back to the north bank of the James for the purpose of consultation, and now has him near his own headquarters, ready to undertake any movement that he may deem necessary to crowd his adversary to the wall. Thus he has swept Lee and Johnston into a position where either or both can be attacked with a very great probability of success. He has placed his left wing in such a position as to be in a very short time within communication with the extreme right wing of Sherman's army. He has literally barred all the avenues of egress by which the foe may escape to the south or west, and now awaits him with open arms. The crisis cannot be long delayed, and soon the crash of the decisive battle may be resounding on the plains of Southeastern Virginia. Thus, by a dramatic fitness, the final battle of the war will be fought upon the "sacred soil" of the State which drank the blood of the patriot heroes of July, 1861.

SELF-REGISTERING BALLOT BOX.

The object of this invention is to secure a self-registering ballot box, or one that would record, by an audible sound—such as ringing a bell—the actual passage of the vote into its proper place. To obtain this end the box is fitted with a transparent tube, A, resembling a lamp chimney externally. At the top is a narrow opening in which the ballot is placed,



and through which it descends to the compartment below; before it can pass through, however, there is a sliding door on which the vote rests, so to speak, which must be moved aside. This door is worked by means of the handle, B, and when actuated it rings a small gong each time, the gong being fastened inside out of the way so that it cannot be tampered with; the bottom of the box is locked up, and can only be opened by the proper key. This is a very neat arrangement to "preserve the purity of the ballot box." It was patented on the 24th of January, 1865. For further information address J. A. McPherson, patentee, 344 Congress street, Troy, N. Y.

The Constitution of Steel.

The London *Mining Journal* says:—"The scientific division of the Belgian Academy of Sciences having proposed to give a gold medal for the best essay on the constitution of steel, at the last meeting of the year on the 16th of December last, the prize was awarded to the paper bearing the device "*Citius emergit veritas ex errore quam ex confusione.*" This memoir is due to Capt. Caron, to whom the committee awarded 800 francs, in addition to the medal, as an extraordinary recompense for the superiority of the essay. Mr. Stas, the chairman of the committee appointed to examine the treatise, reports that the author, Mr. Caron, proves satisfactorily that Mr. Fremy's opinion of the essential presence of azote in steel is untenable, and demonstrates that iron, when passing into the state of steel, does not contain a particle of azote more than it had before the conversion, or more than is contained in the alkalies, through the intervention of which the carbon enters into the iron. He considers that the presence of azote in some steel is due to traces of the azotide, or the azoto-carburet of titanium, which is to be met with in both cast and wrought iron used in the manufacture of steel. That steel is essentially composed of iron and carbon; that it owes its good qualities or its defects to two different causes acting in unison—1st, to the state of the carbon in the metal; 2d, to the nature of extraneous substances which deteriorate it. When steel becomes bad after being heated several times, this proceeds from its carbon having been burned or separated from the iron, a separation which no tempering can remedy, and which is due to the presence of extraneous matter, principally silicium, which impedes the perfect union of the two substances, and gives to the steel different properties or defects, according to the nature or quantity of such impurity."

[This conclusion is in direct opposition to that of Mr. Binks, whose experiments are generally received as settling the point that nitrogen is an essential constituent of steel. But it seems that this vexed question is never to be set at rest.—EDS.

Lighting Gas by Page's Induction Coil.

It is quite probable that but for the death of the inventor, Mr. Arch. Wilson, his apparatus for lighting all the gas jets of a theater or other large building at the same instant by means of Ruhmkorff's—or more properly Page's—induction coil would have been by this time in general use. It is said to have been in constant use in the Music Hall at New Haven, and in Allyn Hall at Hartford, for about four years, and to have worked without failure and with satisfaction at all times. We learn that the patent is in the hands of Mrs. Arch. Wilson, of New Britain, Conn.

WIND AGAINST TIDE.—A tidal phenomenon was observed at the Humber dock gate one day last week. About an hour before high water the tide ceased flowing, and fell from 20ft. 2in. to 20ft. It then began to flow again, and the tide rose about 8in. then stopped for about twenty minutes, and then flowed again about 4in. more. It was now high water, and for the next hour it did not fall more than two inches. A similar tide occurred about 1820, and was followed by a sudden and violent storm.—*Engineer.*

[This was doubtless caused by the wind blowing against the tide and piling up the water; at times, however, the force of the tide was greater than that of the wind, and the water then fell.—EDS.

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VOL. XII. NO. 15...[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, APRIL 8, 1865.

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THE GREAT LOCK-OUT IN ENGLAND.

The manufacture of wrought iron in England is suspended. Saturday, the 6th of March, the works in North and South Staffordshire were closed, and a week afterward the example was followed by the manufacturers in the North of England and in Wales. By this step it is said that 70,000 men are thrown out of employment, $500,000 per week of wages are stopped, and 200,000 persons are deprived of their ordinary means of living.

This deplorable result is the crisis of a quarrel which has been for a long time growing up between the manufacturers and their workmen. A trades' union was first formed among the workmen throughout the kingdom for aiding those of any particular manufactory or district while on a strike. This organization by its great numbers was generally able to conquer in a struggle with any individual master, or even with the combined manufacturers of any small district. The iron masters of the kingdom therefore determined to form an association among themselves in order to oppose their combined power to the organization of the workmen.

There has been a decline in the price of iron and a consequent reduction in the wages of puddlers; but the puddlers in North Staffordshire determined to strike, sooner than submit to this reduction. The Workmen's Union gave its advice in opposition to this, and notified the North Staffordshire puddlers that they would not be supported in it. But the masters, suspecting that the North Staffordshire strikers would be supported by contributions from the workmen throughout the kingdom in their individual capacity, gave notice that if the North Staffordshire strike were not ended by the 4th of March, all the works would be closed on that day. The Workmen's Union protested against this measure as most unjust and cruel, stating that it would entail on great numbers of innocent and helpless men, women and children, an amount and degree of suffering compared with which the fires of Smithfield were merciful.

By our last English papers we see that this appeal was unavailing, and that on the 11th of March the example of the iron manufacturers in Staffordshire was followed by the North of England and Wales, and 70,000 workmen with their families were turned out in forced idleness to get their living the best they could.

MACHINERY THE GREAT MISSIONARY.

Few people reflect how much civilization owes to machinery. Not in countries already refined, not in the land where the sound of the church-going bell is heard, where the telegraphs and printing presses vie with each other in the dissemination of intelligence, but in those obscure quarters of the globe where the mind of the heathen is as dark as his skin, and the obscurity which shrouds his mind is as dense and opaque as the sky above when midnight storms overcast it; there it is that machinery performs its great mission of lifting up and restoring to the world regions and men lost to it.

It is an interesting and curious fact that whatever else barbarians fail to see worthy of imitation in the customs of more civilized races, they never fail to appreciate its machinery. When Commodore Perry undertook his famous expedition to Japan the stolid faces of the Japanese were unmoved while the tedious ceremonials of treaty reading and similar formalities were in progress, but when the circular railroad was put in operation, high and low trod on each others garments to get near it.

When gas was lighted for the first time in the streets of Algiers a crowd of bronzed Arabs followed the lighter exclaiming in awe-struck voice, it is a "djin," meaning an evil spirit. When our steamers first visited Chinese ports the prominent point of interest to the natives was the machinery, and foreign embassies of barbaric or semi-barbaric races visiting this country enjoy to the utmost the inspection of our manufactories. Why should it not be so? Where there is no machinery labor is cheap and the product of it small. In Mexico there are mountains of silver almost, but it is as worthless as the dirt in the streets, because although there are plenty of laborers to mine it, there are no railroads to transport it over, and no steamers to freight it to where it may be made useful. It has been found cheaper to carry cotton from India to England, spin it into cloth and carry it back to be sold again where it was raised than to weave it by native hand power. Ignorant as these barbarians are they welcome the advent of machinery, for whatever their motives, they know full well that where it is their bodies are clothed, their wages increased and regularly paid, and that from being atoms in the mass of humanity they become parts of a system, a plan, an organized industry with a tangible object, and they are humanized, civilized, and elevated accordingly. As the ax of the woodman lets sunlight into the forest, so the advent of machinery breaks down the prejudices of the uncultivated; where sloth was, industry is, and where only force had sway, reason enters.

It is curious also in pursuing this subject to note that the machinery breakers, or men who combine to destroy factories from the fear that their labor will be lost, are not heathen in the general sense, but the ignorant and debased of large cities, men who should know better, and who often do, but are stimulated to misdeeds by other persons. Vague and crude as the perceptions of ignorant men may be there are few so densely stupid as to remain long indifferent to the superiority of machinery over manual labor. It is not so much exemption from arduous tasks that commands respect for machinery from mankind as the scope, the endurance, the increased quantity, the comforts, and the quality of work done by it. The prices of all goods are determined by the supply; if we had no machinery we should have but little cotton; if we had little cotton the few would have used it while the many would wear tow cloth; we should have had few newspapers, books would have been dear, and the spread of intelligence obstructed beyond calculation. To that one machine—the cotton gin—may be directly traced immeasurable advantage.

INAUGURATION OF A NEW SOCIETY.

The New York Association for the Advancement of Science and Art was inaugurated at the large hall of the Cooper Institute, Wednesday evening, March 28th.

The meeting was called to order by Rev. S. Ireneus Prime, D. D., who introduced Joseph B. Varnum, Jr., one of the Vice Presidents of the Association. Mr. Varnum set forth the objects of the society at great length, and then introduced Mr. William Cullen Bryant, who made an exceedingly able, forcible, and graceful address. Mr. Peter Cooper was then introduced, and after reading a short and excellent paper, he remarked that he would mention one incident among the great numbers that were occurring to show that the purposes of the Cooper Union were being successfully accomplished:—

"A short time since I was walking along near my store when an intelligent-looking young man addressed me, and said that he wanted to thank me for the great advantage that he had derived from attending the free courses of instruction at this institute.

"I told him that I did not know that he had ever been here.

"He said he had attended three or four courses, and the instruction which he had received had enabled him to just pass an examination, and to obtain a commission in the engineer department of the navy.

"What gratified me most was, that he said he came from a tenement house where there were large numbers of young men, and had there not been this resource for his evenings he might have been led away with them into courses of vice and folly.

"I indulge the hope that this institution will confer similar advantages upon other young men for many successive generations."

Hon. Horace Greeley then made a few pointed remarks, and after two other speeches, the last one rather long and tedious, the meeting adjourned.

MYSTERIOUS BOILER EXPLOSIONS.

That steam boilers are long-suffering and endure neglect and abuse without destroying the authors of them, is amply proved by hosts of occurrences similar to those related below. By late English mails we learn that a boiler in Birmingham, England, which was worked from a puddling furnace, became so hot that, through want of water, the plates exposed simply bulged out and tore away like a sheet of pasteboard. No other results followed, and the damage ended with the rupture. In another case mud accumulated in a cylinder boiler which caused the plates covered by it to burn out, when the pressure within merely rent the metal, and extinguished the fire; no sooner was the plate replaced by a new one than a similar accident occurred from the same cause. Another injury was caused by reliance upon a float for ascertaining the hight of water, although there were gage cocks in addition; the float became jammed, and the water was evaporated until twelve feet of the boiler become red-hot, resulting in great expense for repairs.

If these boilers had been blown to atoms, if the surrounding buildings had been reduced to rubbish, if hundreds of human beings had been wounded and maimed for life, we should have the theory-tinkers on the stand again, and "ozone" would have been heard from. We should have been told that some mysterious agent, some unknown but tremendous force had been generated by the decomposition of the water, and was the sole cause. Saturated steam discharged from a sound boiler into the superheated atmosphere of the exploded boiler, might have been the cause. In short, there would have been repeated the same farce which is re-enacted whenever a casualty of like nature occurs.

In the cases above cited the boilers themselves knew more than the seekers after mystery do. The one burnt out gave way from a palpable cause, and the same neglect transpiring shortly after, it failed again, showing that it was simply impossible to exist under such a combination of causes. It is so with all boiler explosions. Nine out of every ten can be traced to actual deterioration from long service or misuse, and it is a disgrace to the engineering profession that they should countenance efforts made to shroud them in mystery. The result of such verdicts is simply to invite neglect, for if the engine tender is given to understand that a boiler will explode by causes beyond his control, he becomes a sort of predestinarian, and trusts to luck when he ought to be the personification of vigilance. All the mystery is the mystery of carelessness which might be prevented.

THE lining of tea chests makes a good solder for tin ware, being made of tin and lead in about the proper proportions.

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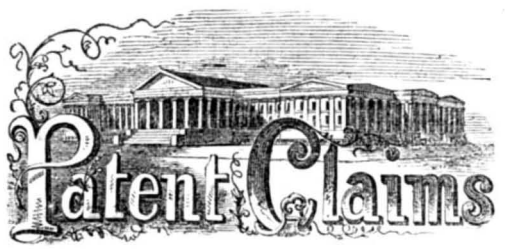

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46,980.—School Desk and Seat.—John P. Allen, Richmond, Ind.:

In the construction of school furniture I claim the piece, A, so constructed as to constitute a leg or support for the seat, E, and also a support, as well as a means of attachment, for the bookshelf or bottom, g, of the book box, substantially as set forth.

46,981.—Ratchet Drill.—Edward H. Ashcroft, Lynn, Mass.:

I claim in a ratchet drill having a removable extending screw, which works when the tool is in use in an opposite direction to the drill, making the drill in one piece between the movable cap and the drill socket.

46,982.—Writing Tablet.—George Asmus, Houghton, Mich.:

I claim a combined writing tablet, ruler and paper cutter, constructed as described, as a new article of manufacture.

[This invention relates to a writing tablet which can be used as a paper cutter and ruler, and which proves to be of great convenience for the purpose of holding blank paper to be used as a desk or in or about a factory or in the army or other operations for memoranda or notices. When made on a large scale it may also be used for holding and measuring drafting and other paper or prints, cloth, etc.]

46,983.—Treating Ores.—G. W. Baker, New York City:

I claim, first, The utilization of waste heat and vapors created in the treatment of pyrites containing the precious metals, in the manner substantially as and for the purposes set forth.

Second, The forming of sulphurous acid substantially as described for the purpose of treating the calcined ores whether containing only the baser metals or the baser metals with gold and silver.

Third, The use of sulphurous acid thus formed in treating the calcined ores for the purpose of converting the insoluble oxides into soluble sulphates, especially copper as described.

Fourth, The method of obtaining a highly concentrated solution of the baser metals by lixiviating with the acid, and submitting the weaker solution, obtained by lixiviating with water, to the acidulating process as set forth

46,984.—Roasting and Desulphurizing Ores.—G. W. Baker, New York City:

I claim, first, A reverberating retort constructed and operating substantially as herein described.

Second, The use of steam as a blast to carry forward the vapors evolved from the ore and surround the latter with a constantly changing atmosphere.

Third, The blast chamber, A, boiler, B, arranged relatively with the fire chamber, C, substantially as shown, when said parts, thus arranged, are used in connection with a hot air pipe, K, leading from the ash pit of the fire chamber into the flue, I, which forms a communication between fire chamber, C, and one or more reverberating retorts, H, for the purpose herein set forth.

Fourth, The coil, D, in combination with the boiler, B, hot air chamber, E flues, g, and steam coil, F, all arranged to operate substantially as and for the purpose specified.

Fifth, The annular passages, L, at the lower parts of the retorts arranged as shown to communicate with the smoke stack to form reverberating retorts.

Sixth, The conical feeders, M, arranged or applied to the retorts, substantially as and for the purpose herein set forth.

46,985.—Gate.—Franklin Ball, Cleona, Iowa:

I claim a gate constructed substantially as described, or in any equivalent way, so as to be capable of being opened and closed by raising or lowering it in a vertical plane, when said gate is hung so as to swing and open and close laterally, substantially as described.

I further claim the bar, D, pivoted to post, B, grooved at its under side to receive the upper ends of the pickets, d.

[This invention relates to a new and improved gate, and it consists in constructing the gate in such a manner that it will be balanced, or nearly so, on its hinges, open and close laterally like an ordinary hinged gate and at the same time be capable of being opened by elevating or raising it vertically, the latter mode being resorted to if snow, ice, or other obstructions of any kind should prevent it from opening laterally.]

46,986.—Mouth Piece for Cigars.—Jonathan Ball, Elmira, N. Y.:

I claim the wooden mouth piece herein described constructed with a cylindrical end, b, and a conical front, c, as specified.

46,987.—Mode of Preparing Inflamable Liquids so as to prevent Accidents.—Thomas J. Barron, Brooklyn, N. Y.:

I claim giving to explosive and inflammable oils and fluids, used for illuminating and other purposes, a bright distinct color, to plainly distinguish them from other oils and fluids, substantially as and for the purposes set forth.

46,988.—Process for Lining Barrels for Holding Oils, etc.—Julius Baur, New York City:

I claim, first, The above described process substantially as set forth, of lining or coating barrels and other articles designed to contain petroleum, benzine, oil, ground lead or paint, and other similar substances.

Second, The above described process, substantially as set forth, of lining or coating barrels and other articles designed to hold alcohol, wines, whiskey, and other substances which contain water.

Third, The above described process of lining or coating barrels or other receptacle designed to contain any of the herein before referred to articles, when the soluble glass employed in such process is dried thoroughly into the substance of the barrel or other receptacle, substantially as set forth.

Fourth, The employment of soluble glass, whether alone or in union with other matters, to impregnate, or, as it were, petrify, any article which is designed to be secured against leakage or evaporation.

[This lining is particularly intended for preventing leakage in petroleum barrels or packages, but it can be used with advantage for barrels or kegs containing paints or oils of any other description and also for alcohol, whisky, etc.]

46,989.—Tobacco Smoke Purifier.—John Bavier, Newark, N. J.:

I claim a detached smoke purifier constructed substantially in the manner and for the purpose herein above specified.

46,990.—Water Meter.—John B. Benton, New York City. Ante-dated March 12, 1865:

I claim constructing a meter substantially as described to divide the entire flow of water in given proportions and measure only a portion of the water which passes through the machine.

I also claim the employment in combination with the measuring reservoir, of a siphon arranged to operate as specified and automatically discharge the contents of the reservoir as set forth.

46,991.—Slide Valves.—Chas. H. Brightly, Philadelphia, Pa.:

I claim the arrangement of the port box, D, box valve, B B, and brace, E, substantially as and for the purposes herein described.

The arrangement of the port box, D, box valve, B B, screws, h h, and screw threaded brace, E, substantially as herein described.

Third, The manner herein described of arranging the adjusting screws, h h, with the valve, B B, and port box, D, for the purpose set forth.

46,992.—Balance.—Henry A. Clum, Rochester, N. Y.:

I claim the use of a spiral spring in combination with the plunger and mercury in order to impart increased capacity to scales capable of determining light weights substantially as herein set forth.

46,993.—Machine for Cutting and Preparing hay for Baling.—Samuel Colaham, Cleveland, Ohio:

First, I claim the cylinders, F and F', in combination with cutter head, H and blade, J, when arranged as and for the purpuse set forth.

Second, I claim the carrier or apron, P, and guide, R, in combination with the cutter head and hopper as and for the purpose set forth.

46,994.—Cow Milker.—L. O. Colvin, Philadelphia, Pa.:

I claim the employment or use, in a device for milking cows, of a series of pumps, one for each teat of the cow, arranged in such a manner as to be operated simultaneously by a single lever and still work independently of each other substantially as and for the purpose herein set forth.

I also claim providing the pump aforesaid with check valves provided with openings in such a manner as to admit of the ready withdrawal of the teats from their tubes and still cause the latter to hug or retain the former to a necessary degree as described.

I further claim the combination of the pumps, pump valves, milk receptacle and discharge spout all arranged to operate in the manner substantially as and for the purpose specified.

[This invention consists in constructing a cow milking device with a plurality of pumps, one for each teat of the cow, and having said pumps operated simultaneously by a single lever, but each pump operating independently of the others, whereby the cow may be thoroughly milked from each teat, or in other words each teat milked comfortably dry.]

46,995.—Rotary Spader.—Cicero Comstock, Milwaukee, Wis.:

First, I claim the curved tine or tooth, widest at the point, with notch on the concave side of the head to embrace the fork-bar and stirrup or clamp, and sharpened at the point by being beveled on the concave side substantially as herein recited.

Second, Securing the tooth or tine to the fork-bar by the stirrup or clamp and key as herein recited.

Third, The combination of the fork-bar, clamp, key and tine or tooth having the notch as and for the purpose herein set forth.

Fourth, Securing by casting the lugs on the ends of the fork-bars to which to hang the friction roller or wheels.

Fifth, casting the handles or cranks on the fork-bars as and for the purposes described.

Sixth, Such a location of the handles or cranks on the fork-bars in reference to the main wheels that when the main wheels are keyed in place shall secure the forks in position, as herein named.

Seventh, Driving the keys which secure the main wheels to the axles towards the center of the machine so that the bubs of the cams bearing against the heads of the keys will prevent the keys from loosening or coming out.

Eighth, The arrangement of the collars and sockets set forth for excluding the dirt from the interior of the cam hubs.

Ninth, Alternating the tines as and for the purposes set forth.

Tenth, The spring on or near the back part of the cam for the purpose recited.

Eleventh, Making that portion of the central part of the cam which governs the action of the forks in the ground a separate piece so that the same may be replaced as herein stated.

Twelfth, The construction and arrangement of the links and levers for actuating the movable section of the cam and permitting the same to be self-actuating as herin described.

46,996.—Saw.—Rowland Cromelien, Washington, D. C.:

I claim the arrangement and combination of three saw blades, with their teeth filed and arranged at any angle required, and fastened firmly to a wedge or V-shaped back, as herein described and for the purposes set forth.

46,997.—Dancing Toy.—James M. Cromwell, New-York City:

First, I claim the employment or use of the lever, C, with arm, D, attached in connection with one or more rods, E, suspended to D, and figures, F, suspended to E, substantially as and for the purpose specified.

Second, The employment or use of a clock movement in combination with the figures, when the latter are operated from the former, in the manner substantially as set forth.

Third, The adjustable prongs or arms, i i, in combination with the lever, C, for the purpose of controlling or regulating the vibration of the latter, for the purpose specified.

[This invention relates to a new and improved toy composed of dancing figures, and it consists in suspending the figures to the operating mechanism and constructing the latter in such a manner that the figures will, when the device is put in operation, have the grotesque motions peculiar to the ordinary ethiopian or negro dancers.]

46,998.—Engine Head Light.—S. M. Davies, Chicago, Ill.:

First, I claim the use and employment of the semi-cones, D D D D, for the purpose and in the manner described.

Second, The use and the employment of the semi-frustums of cones, H H H H, in the manner and for the purpose described.

Third, The combination of semi-cones, D D D D, with the semi-frustums of cones, H H H H, in the manner and for the purpose described.

46,999.—Clothes Dryer.—J. H. Doughty, New York City:

I claim in combination with the bracket, A, constructed as herein shown and described, the radial arms, B B, pivoted within the said bracket so as to be expanded or folded together in a horizontal plane as specified.

47,000.—Horse Collar.—Samuel B. Edson, Kokoma, Ind:

I claim as an article of manufacture the horse collar, A, in combination with the hocking clasp, c d, the whole constructed and operated substantially as described.

47,001.—Boring Drill.—Daniel R. Erdmann, Philadelphia, Pa.:

I claim the within described drill, having projections, d d, arranged respect to the cutting edge of the said drill as and for the purpose set forth.

47,002.—Connections for Water Pipes.—Ransom Farr, Chesterfield, N. H.:

I claim connecting the sections of a water pipe together with a single connecting piece or casting laterally as well as longitudinally substantially as described

47,003.—Propulsion of Steamboat.—Alfred Fellows, Maquoketa, Iowa:

First, I claim the application of endless propelling chains to the forepart of a boat constructed with a central water way, substantially as and for the purpose herein set forth.

Second, In combination with a boat of the construction specified, I claim a plurality of rudders hung centrally upon their shafts and mounted within or opposite to the water way, substantially as and for the purposes set forth.

47,004.—Connection of the Sail to the Mast of Navigable Vessels.—Charles L. Fisher, Chelsea, Mass.:

I claim my improved mode of attaching a sail to the mast of a vessel, the same being substantially in manner and so as to operate as and for the purposes set forth.

47,005.—Traction Wheels for Rotary Plows.—Lemue S. Fithian, Rahway, N. J.:

First, I claim a traction wheel or drum which is provided with beveled slats or bars extending obliquely across it, and operating substantially as described.

Second, Securing the slats of a ground propeller to the radial spokes of three or more wheels, which are constructed and braced substantially as described.

Third, The employment of metal face plates e e, in combination with the beveled and obliquely arranged slats, g, substantially as described.

47,006.—Ice Sandal.—Edward Fitzki, Philadelphia, Pa.:

I claim, First, An ice sandal made of two parts connected together by a slotted plate and springs, substantially as and for the purpose described

Second, The revolving longitudinally adjustable rods, f f', with points, g, in combination with the sandal, A, constructed and operating substantially as and for the purpose set forth.

Third, Making the creeper rods, f f', adjustable by means of buttons, i i, or their equivalents, substantially as and for the purpose specified.

Fourth, The cam, m, in combination with the creeper rods, f f', and sandal, A, constructed and operating substantially as and for the purpose set forth.

47,007.—Caster for Furniture.—Frederic G. Ford, Washington, D. C.:

I claim the socket or tube, B, with its circular recess, a a, in the disk, and its corresponding projecting ring, c c, on the swivel, C, in combination with the fastening screw, D, which forms the pivot, for the purposes herein set forth.

47,008.—Hanging Cultivator Teeth.—Joseph Fowler and F. M. Bacon, Watertown, Wis.:

We claim retaining the cultivator tooth by friction against a quadrant bearing substantially as specified, so that the said tooth can be in a vertical or in an inclined position and will yield to obstacles without injury to the tooth, as specified.

47,009.—Seeding Machine.—Joseph Fowler and F. M. Bacon, Watertown, Wis.:

We claim the slide, g, moving in the supports, h, in combination with the blocks, 2 and 3, bars, 4 and 5, and lever, i, to regulate the size of the seed cells, in the manner and for the purposes set forth.

47,010.—Boots and Shoes.—B. D. Godfrey, Milford, Mass..

I claim a boot or shoe having a construction substantially as here in described.

47,011.—Oil Ejector.—W. R. Greenleaf, Buffalo, N. Y.:

I claim the application and use of the conical cup or vessel, B, or equivalent device, to the induction pipe or openings of a pump, ejector or other instruments for raising liquids from wells or reservoirs, by which a perfect separation is effected of any gas which the well may contain from the liquid being raised and the gas thus prevented from entering said pump or ejectors, substantially as set forth

47,012.—Hydrogen Lamp.—Conrad Hagen and Frank Aurnhammer, New York City:

We claim the application of the arm, b, in combination with the plug, E, block of zinc, H, lever, G, and spring plug, f, all constructed and operating substantially as and for the purpose herein shown and described.

Also making the sponge adjustable toward and from the discharging end of the plug, as set forth.

[This invention consists in the application of an oscillatory arm secured to the plug of the cock which serves to admit the hydrogen gas to the platina sponge in combination with the block of zinc and with a suitable spring acting on the lever which serves to open the cock in such a manner that on depressing said lever, or on opening the cock, the zinc block is lowered into the acid contained in the jar and a sufficient quantity of hydrogen gas is evolved to produce the desired effect, and when the lamp is not used, and as soon as the lever is relieved from pressure, it flies back to its original position closing the cock and raising the block of zinc above the surface of the acid, and the evolution of an excess of gas is prevented.]

47,013.—Machine for Cutting Sheaf Bands.—Henry Haines, Farley, Iowa:

I claim the endless carrier in combination with the endless belt of knives, said parts being placed within a suitable frame connected with the thrashing machine, and all arranged to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and useful machine for cutting the bands of grain sheaves while the same are being fed to a thrashing machine. The object of the invention is to obviate the necessity of untying the sheaf bands preparatory to feeding the grain to the thrashing machine.]

47,014.—Process for Brewing.—Adolph Hammer, New York City:

I claim, First, Heating the mash in brewers' tuns by means of one or more chambers arranged above the chamber containing the mash, substantially as described, when the heated current of fluid passes down into the mash and heats the same gradually to the desired temperature while the said malt is compelled to float.

Second, The oblique pipe or pipes, E, applied in combination with the heating chamber, D, substantially as and for the purpose described.

47,015.—Car Axles.—John W. Hard, Decorah, Iowa:

I claim, First, The spring dogs, b b', and scolloped recesses, a a', in combination with the half axles, A A', and half couplings, C C', constructed and operating substantially as and for the purpose set forth.

Second, The annular oil reservoir, d, and radiating chambers, e, in combination with the half axles and couplings constructed and operating substantially as and for the purpose described

Third, The circular grooves, h h', near the outer ends of the half couplings applied and operating substantially as and for the purpose specified.

Fourth, The wings, i, projecting from the peripheries of the half couplings, substantially as and for the purpose set forth.

[This invention relates to certain improvements in that class of car axles which are made in two parts, so that each wheel may revolve independent of the other.]

47,016.—Corn Cultivator.—John Harper, Salem, Iowa:

I claim, First, The frame, F F, adjustable on the segmental guide rods, C C, as specified.

Second, I claim the manner in which the front shovels are attached to the bar, B, turning them to or from the corn as may be required, in combination with the lever, L, substantially as and for purposes set forth.

47,017.—Cultivator.—John Harper, Hillsborough, Iowa:

I claim the slotted shovel standards, P, in combination with the lever, L, rope, O S, and stirrup, V, the several parts being constructed, arranged, and operating as and for the purpose set forth.

47,018.—Skate.—Wm. Hawkins, Birmingham, Conn.:

I claim so constructing a skate that the sliding heel clamp shall be held or retained vertically within the seat or bearing formed for it in the stock independently of the set screw, as and for the purposes substantially set forth.

47,019.—Wood-splitting Machine.—John Henry Hildebrandt, Brooklyn, N. Y.:

First, I claim the combination of the conductor, G, through which the blocks descend by their own gravity, and the inclined plane knife, F, constructed and arranged to operate as specified.

Second, The feeder, H, constructed substantially as herein specified, and operating in combination with the conductor, G, and knife, F, in the manner and for the purpose described.

47,020.—Sorghum Evaporator.—D. H. Iseminger, Heyworth, Ill.:

I claim the combining of the register, G, with the pipe, L, and furnace, C, all arranged substantially as and for the purposes set forth.

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Second, I claim, in combination with the furnace, C, and pan, H, the longitudinally-divided pan, J, divided flues, B B, and dampers, D D, all arranged and operating as described.

[This invention relates to a new and improved device for evaporating sorghum, and it consists in a means employed for treating the juice preparatory to its entering the evaporating pan, thereby economizing in time.

47,021.—Cultivator.—C, M. Jenne, Young America, Ill.:

First, I claim the axle, A, arranged or applied to the draught pole, C, substantially as shown, to admit of a forward and backward play thereon, for the purpose set forth.

Second, In combination with the above, I claim the rods, D D, attached to the draught pole, C, and passing through the axle, A, with springs, a, on their rear ends, to operate substantially as and for the purpose herein set forth.

Third, The stirrup, H, applied to the draught pole, C, in combination with the bars, I I, rods, f, links, g, and axle, A, all arranged substantially as and for the purpose specified.

Fourth, The rods, M M, attached to the plow beams, J J, and connected by links, N N, with the adjustable plates, O O, on the draught pole, C, substantially as and for the purpose set forth.

Fifth, The bar, E, connected by a hinge or joint, b, with the rear of the draught pole, C, in combination with the rod, F, and adjustable plate, G, for the purpose specified.

[This invention relates to a new and improved cultivator, for plowing and cultivating corn and other crops which are grown in hills or drills, and it consists in a novel construction and arrangement of parts, whereby the plows may be adjusted laterally and vertically with the greatest facility, and, at the same time, a very strong and durable implement obtained for the purpose specified.]

47,022.—Hand-mowing Machine.—G. W. Jennings, Boston, Mass.:

I claim the internal teeth, d, of the wheel, B, the pinion, D, and bevel gears, E F G, in connection with the crank pin, g, of shaft, H, and the slotted lug, i, on the sickle bar, L, all arranged to operate in the manner substantially as and for the purpose set forth.

I further claim the caps, C C, on or over the wheels, B B, with the finger bar, M, and handles, D, attached thereto, substantially as described.

47,023.—Attaching Ornamental Heads to Picture Nails.—Albert D. Judd, New Haven, Conn.:

I claim attaching the ornamental head to a picture nail or other article, by means of the disk, d, collar, b, and lug or lugs, c, as specified.

47,024.—Wheat Drill.—Gideon King, Eminence, Ky.:

First, I claim the drill board, E, in combination with the plow, as specified.

Second, I claim the feed frame, O, in combination with the drill board, E, as and for the purpose set forth.

Third, I claim the shaft, q, for connecting the drill board, E, to the plow beam, as and for the purpose described.

Fourth, I claim attaching the drill board, E to the forward end of the plow beam by means of the propelling rods, A and e, and staple, c, as and for the purpose specified.

Fifth, I claim the feed nut, V, in combination with the drill board, E, and wheel, I, when constructed as and for the purpose set forth.

Sixth, I claim the adjustable wedge in the heel of the drill board, E, and in combination therewith, as and for the purpose specified.

Seventh, I claim the adjustment of the wheel, J, upon the shaft, J, in combination with the drill board, E, as and for the purpose described.

Eighth, I claim the stopper, Y, and temper screw, X', in combination with the feed nut, V, as specified.

Ninth, I claim attaching the drill board, E, to the heel of the plow by means of the curved rod, K, as and for the purpose set forth.

Tenth, I claim the adjustable plate, S, at the rear end of the drill board, E, for the purpose described.

Eleventh, I claim depositing the seed between the last furrow plowed and the furrow being plowed, as herein specified, by means of the drill board, E.

47,025.—Vessel for Boiling.—Werner Kroeger, Milwaukee, Wis.:

I claim the copper band, B, applied in the manner described to tin vessels, used for heating or boiling, for the purpose explained.

47,026.—Signal Tower.—Benj. P. Lamason and Sidney D. King, Alexandria, Va.:

First, We claim the short arms, N N, the bolster, I, when constructed and used in the manner and for the purpose herein described.

Second, In combination with the above, and with the vertical iron screws, C C C C, we claim the spur wheels, D D D D, pinion wheel, E, verticle shaft, F, and bevel gear wheels, H H, arranged and operating substantially as and for the purpose herein specified.

47,027.—Apparatus for Treating Offal, Etc.—Adam W. Louth, Philadelphia, Pa.:

First, I claim one or more boilers, H and H', with their gates or doors, in combination with the building, B, oven, D, chimney, G, and its fire-place, the whole being arranged substantially as described, so that the fumes generated by the treatment of the offal shall, before escaping to the air, be thoroughly burned and disinfected.

Second, The closed building, B, with its trucks, M and N, in combination with one or more boilers, H and H', and the oven, D.

Third, The boilers, H, combined with the reservoir, J, and the steam pipes, f f and g, or their equivalents, arranged substantially as set forth, so that the fat rising to the surface of the water in the boiler shall be discharged into the reservoir.

Fourth, The tank, K, with the discharge pipe, l, arranged in respect to the building, B, and boiler, H, substantially as specified.

Fifth, The truck, N, with its tilting frame, o, and trays, q, constructed and operating substantially as and for the purpose set forth.

47,028.—Saddle Valise.—Robert McMurray and James S. Topham, Washington, D. C.:

We claim the springs, F, in combination with a cylindrical saddle valise, constructed and arranged substantially as described.

47,029.—Combined Planter and Cultivator.—Ives W. McGaffey, Chicago, Ill.:

I claim, First, The slotted braces, C c, in combination with the beam, A, and handles, B, for the purpose of adjusting the latter, as set forth.

Second, The reversible bevelled blocks, K J and G, when arranged to operate in combination with the beam, A, and plow standard, for the purpose of adjusting the latter, as described.

Third, The hinged division plate, X, arranged to operate in connection with the seed hopper, as and for the purpose set forth.

Fourth, The adjustable spring, P, in combination with the seed plate, L, when constructed and arranged to operate substantially as herein described.

Fifth, The combination of rod, I, plate and spring, P, arranged to operate as and for the purpose set forth.

47,030.—Apparatus for Leveling Grain in a Vessel Hold—George Milsom, Henry Spendelow and G. V. Watson, Buffalo, N. Y.:

We claim, First, Connecting a number of scoops or shovels, A, together, by an inflexible extensible rod or stretcher, C, for the purposes and substantially as described.

Second, Connecting the ropes or chains, C', by which motion is given to the scoops or shovels, A, to the connecting rod or stretcher, C, at points between the end scoops or shovels, substantially as and for the purposes set forth.

Third, A reversible scoop or shovel, Fig. VIII., constructed and operating on the rod, as and for the purposes set forth.

Fourth, A double-acting scoop or shover, Fig. XI., constructed and operating on the rod, as and for the purposes set forth.

Fifth, The combination of the windlass barrels, F, and changing levers, I, so located and connected that a person or persons stationed in the hold of a vessel where the grain is, and having full view of the moving scoops or shovels, shall also have control of said windlass, barrels and shovels, to regulate and control the movements thereof, substantially as set forth.

47,031.—Coupling Tool for Drilling.—John Robert Moore, Brooklyn, N. Y.:

I claim the improved mode of coupling, substantially as described

47,032.—Buck-saw Frame.—Wm. Morehouse, Buffalo, N. Y.:

First, I claim the combination of the parts, A B, clips, d d, screw rod, F, and screw nut, g, or their equivalents, substantially as described.

Second, I claim a sliding bar, D, for effecting the straining of the saw blade of a buck-saw, substantially as described.

47,033.—Automatic Track Layer.—John L. Nicolai, Chicago, Ill. Antedated March 10, 1865:

First, I claim the endless belts, G, provided with hooks or their equivalents, in combination with a vehicle to be moved upon a track, constructed substantially as described, and operating substantially as and for the purposes described.

Second, I claim, in combination with the above, the elastic arms, b d and e, or their equivalent, operating as herein set forth

Third, I claim the combination and arrangement of the endless belts, G, the wheels, F and E, with the drums, C D, and truck wheels, A, operating in the manner shown and described.

Fourth, I claim providing the wheels, F, with the pins, f, when used in combination with the planks, L, provided with the pins, r, or the hinged pins, p, arranged and operating as and for the purposes shown and specified.

Fifth, I claim the arrangement of the springs, m, with the pins, r r, the flanks operating as and for the purposes herein described.

Sixth, I claim the combination of the belts, G, provided with hooks, as aforesaid, with the planks, L, provided with the pins, l, all arranged and operating as and for the purposes specified.

Seventh, I claim the combination and arrangement of the wedge-shaped point, e, with the depression, n, and pins, o o, as and for the purposes set forth.

Eighth, I claim the manner of constructing a truck herein shown, whereby the same is made removable by sections, as and for the purposes shown.

Ninth, I claim taking up said sections of the track from the rear of the machine, and depositing them in front thereof, by an automatic mechanism, attached to a vehicle moving over said track, substantially as herein shown and set forth.

47,034.—Oil Ejector.—F. S. Pease, Buffalo, N. Y.:

I claim, First, Raising oil or other liquids from wells and other deep places by intermittent pulsative action, or repeated vibration of a confined body of air or other fluid, substantially as herein set forth.

Second, I also claim the arrangement, substantially as herein shown and described, of a double acting air pump, and a compressed air chamber, and an exhausted receiver, in combination with an air conducting pipe, e, communicating with a well tube.

Third, I also claim the arrangement of the valve chamber, A', at or near the bottom of a well tube, either within the same or connected therewith with an upper and lower valve, each opening upward, the upper valve communicating with the chamber, A', by means of a tube, m', substantially as described.

Fourth, I also claim the valves, g n, of the valve chamber, A', operated by means of the vibrations of a column of air, alternately filling the chamber with air and exhausting the same, for the purpose of raising oil and other liquids from deep wells, substantially as described.

47,035.—Medical Compound.—Ebenezer Penfield, Oberlin, Ohio:

I claim the use for medical purposes of an extract of flax prepared substantially in the manner herein set forth.

[The inventor of this compound was born Feb. 26, 1773, and is consequently over 92 years of age. The invention relates to the employment or use of the gummy and resinous substances contained in the various parts of the flax plant, prepared in various ways, and applied either externally or internally as a remedy for various diseases, such as the ring worm, cuts, bruises, burns, corns, callous skin, contracted sinews or cords, or for cough, cold in the head, fever, looseness in the bowels, diarrhea, scrofula, etc. The extract is applied in the form of liquid, or in sirup form, or in the form of snuff, or it may be used externally as an ointment.]

47,036.—Hoisting Machine.—S. B. Phelps and C. A. Slack, Norwich, Vt.:

We claim as our invention the combination of the windlass, A', the ratchets, D D', pawls, E E', the levers, C C', the sliders, F F', the screws, G G', the screw boxes, H H', or their equivalents, and the gears for connecting the shafts, the whole being arranged and applied to the frame, B, and its projections, O O', and so as to operate together, substantially as specified.

And we claim the combination or the two pawl trippers, R R', or their mechanical equivalents with the said windlass, its ratchets, pawls, levers, sliders, screws, and the connecting gears thereof, the whole being arranged in manner and so as to operate substantially as set forth.

47,037.—Wool Presses.—John W. Phillips, Randolph Center, Wis.:

I claim, First, The combination and arrangement of the side pieces, A, provided with the hooks, X, and springs, S, the center piece, C, and the end pieces, B, provided with the strips, b, when constructed and operating substantially as and for the purpose specified and set forth.

Second, The combination and arrangement of the side pieces, A, provided with the hooks, X, and springs, S, the center piece, C, and the end pieces, B, when constructed and operating substantially as described.

47,038.—Washing Machine.—S. Safford Putnam, Dorchester, Mass.:

I claim the receptacle, A, with its slats, d, so arranged as to form a continuous rubbing surface, and a chamber, F, substantially as set forth, for the purpose specified.

47,039.—Wind Wheel.—Lewis Reese, Rolling Prairie, Ind.:

I claim the combination and arrangement of the radial arms, H H, and the friction blocks, K K, so as to operate in conjunction with a friction ring or plate, G, upon the wind wheel, A, substantially in the manner and for the purpose herein set forth.

I also claim the combination of a swinging lever, O, and attached cord and weight, P, with the rear end of the slicing shaft, B, of the wind wheel, A, when arranged substantially in the manner and for the purpose herein set forth.

47,040.—Method of Preventing the Corrosion or Staining of the Surfaces of Glass.—Wm. B. Richards, New York City:

I claim the mode herein specified of protecting the surface of glass, after it has been manufactured, from corrosion and staining, as set forth.

47,041.—Coal Screen.—John A. Robinson, Pittston, Pa.:

I claim the employment or use of screens, A B, arranged substantially as shown and described, for the purpose of screening coal in its discharge to the cracker and grading screen, as set forth.

I further claim constructing the upper screen, A, with movable or adjustable bars, arranged to operate substantially as herein described.

[This invention relates to a new and improved screen for screening coal, designed more especially for screening coal preparatory to cracking the same, and it consists in constructing the screen of fixed and adjustable or sliding bars arranged in such a manner that the screen may be graduated to let through lumps of coal of greater or less size as may be required, and the dust and fine coal not necessary to be cracked not allowed, as hitherto, to pass through the cracker.]

47,042.—Hay Fork.—Wm. F. Rundell, Genoa, N. Y.:

I claim the ferule, D, fitted on the handle, C, and provided with an end, a, which projects beyond the end of the handle, and has a square hole, b, made in it, in connection with the key or wedge, E, and screw on the tang, B, of the fork—all arranged substantially as and for the purpose specified.

[This invention relates to a new and improved manner of securing the fork to the handle or "stale," as it is frequently termed, whereby the fork may be firmly secured to the handle or "stale," and the latter not weakened but rendered sufficiently strong just where strength is required, to wit, at the junction of the fork and handle.]

47,043.—Machine for Making Earthenware.—Cyrus W. Saladee, Putnam, Ohio:

I claim, First, Constructing a machine in the manner described, or its equivalent, so as to form earthenware without the necessity of weighing or measuring the clay.

Second, The hollow forming plunger, B, or its equivalent constructed and operating in the manner and for the purpose described.

Third, The feeding cylinder, A, or its equivalent, constructed and operating in the manner and for the purposes described.

Fourth, The molds, C, when constructed and operating so as to open in halves vertically as described.

Fifth, The vent pin, Q, or its equivalent, constructed and operating as described.

Sixth, The mold table, D, or its equivalent, constructed and operating as described.

Seventh, Attaching the lining, Z, to the lap edges of the molds when the lining is composed of woolen or other non-elastic fabric, and closely conforms to the shape of the mold in the manner and for the purposes specified.

Eighth, The mode described, or its equivalent, of producing letters or designs upon the earthen ware.

47,044.—Fruit Gatherer.—A. Selover, Brooklyn, Ohio:

I claim a fruit gatherer constructed and operating as herein set forth.

47,045.—Cooking Range.—Charles J. Shepard, Brooklyn, N.:

First, I claim the use or employment of flanched sectional top plates, L, for the purpose specified.

Second, I claim the flue division or diaphragm, J, arranged as shown for the purpose set forth.

Third, I claim the back flue, H, operating substantially as described for the purpose set forth.

Fourth, I claim the use or employment of the top ovens, N, for the purpose specified.

Fifth, In combination with the flue division or diaphragm, J, I claim the slide valve, I, for the purpose specified.

Sixth, I claim the interior flue bricking, K, at the outer ends of the range, for the purpose specified.

47,046.—Placer Mining.—Cornelius H. Smith, Rock Island, Ill.:

I claim, First, Washing metalliferous earths and ores by currents of water forced by steam pumps or mechanical power and delivered in jets in contact with the earth or ores.

Second, I further claim forcing water by pumps or other mechanical means for washing earths and ores under such a system of water pipes and return channels that the water is returned to its reservoir for repeated use, substantially as set forth.

47,047.—Beehives.—Orlando Sprague, Fulton, Ill.:

I claim the use of corn cobs as a lining or covering for or in connection with beehives, substantially as and for the purpose set forth.

47,048.—Pole Propeller.—Arold F. Stelle, Crossingville, Pa.:

I claim the levers, K K H H, and the propellers, S S W W, in combination with the eccentric wheel, C, and the connecting rods, E F, when the same are constructed in the aforesaid combination for the purposes set forth.

47,049.—Fire Pot for Stoves, Furnaces, etc.—Philo P. Stewart, Troy, N. Y.:

I claim the employment of a fire pot, constructed, arranged and combined in the manner substantially as and for the purposes herein described and set forth.

47,050.—Apparatus for Raising Dough.—Thomas Stockton, North Chenango, Pa.:

I claim the employment of a hot water holder, A, in combination with the dough receptacles, C, supported by rods, B, above the level of the water, substantially in the manner and for the purpose herein shown and described.

47,051.—Automatic Steam Pump.—Eli Thayer, Worcester, Mass.:

I claim the combination of the coil or heater, K, including the globe valve, H, and the check valve, I, with the main tube, A, and the other valves and pipes connected with it, for the purposes and in the manner above described.

47,052.—Grate Bars for Boilers.—Eli Thayer, Worcester, Mass.:

I claim the hollow grate bars connected with the boiler through the pipes, b b' and c c', and adapted to be cleansed by the aid of the cocks, 1 2 3, arranged in the manner substantially as herein described.

47,053.—Steam Generator.—Eli Thayer, Worcester, Mass.:

I claim the arrangement of the several parts herein described, viz. the stop cock, g, the cheek valve, c, the vent cock, h, the tube or pipe constituting the grate, including its connections both with the boiler and the vent cock, h, and the screen which covers and protects the grate, in the manner and for the purposes above described.

47,054.—Steam Generator.—Eli Thayer, Worcester, Mass.:

I claim, first, the method of clearing the coils of sediment by reversing the steam in them, and,

Second, The false bottom or movable plate, D, to be used in the manner and for the purposes described.

47,055.—Cultivators.—J. H. Thomas and P. P. Mast, Springfield, Ohio:

First, We claim swinging the suspenders, I I, from the top of the standards, G G, for the purpose set forth.

Second, We claim the combination of plates, H H, suspenders, I I, and standards, G G, as described and for the purpose set forth.

Third, We claim so pivoting the rock shaft, O, from which the beams, E, are suspended as that when the handle, a, is turned up and thrown forward, it shall remain in that position, and thus keep the plow suspended, without the use of any catch or other device, substantially as set forth.

Fourth, The adjustable stop, k, in combination with the adjustable stretcher, K, and suspenders, I I, substantially as set forth.

Fifth, We claim the shaft and journals, j j, in combination with the braces, f, and drag bars, F F, whereby the supplemental tooth may be readily attached, maintained in position, and allowed to swing backward when the woolen pin, c, is broken substantially as described and set forth.

47,056.—Flour Sifter.—Howard Tilden, Philadelphia, Pa.:

I claim the combination of the equi-quadrilateral shaft, C, or its equivalent, having on two or more of its corners the rubber strips, i i, or their equivalent, with the sieve, B, and the box, A, substantially as described and for the purposes set forth.

47,057.—Valve for Steam Pipes.—A. R. Treadway and S. R. Warner, New Haven, Ct.:

We claim the hinged valve, C, combined with an inclined seat, B, so as to operate substantially as and for the purpose specified.

47,058.—Combined Desk and Work Table.—Joseph Trevor, Lockport, N. Y.:

I claim as a new article of manufacture, a convertible desk and work table, consisting of the pivoted cross frames, A A', falling top, E, pivoted slat, D, and flexible bag, G, arranged and combined substantially as described.

47,059.—Flask-pins.—Barnett B. Whaley, Brooklyn, N. Y.:

I claim an adjustable flask-pin constructed with two inclined planes so arranged that by moving one of the planes upon the other the spindle of the pin can be adjusted to fit its socket in the manner and for the purposes set forth.

47,060.—Operating Parts of a Fountain Ink Stand.—Wm. A. Wheeler, New York City:

I claim the use of a diaphragm made of two thicknesses as described for fountain inkstands, in combination with the double-headed button, h i', and screw, n, and cap plate, p, arranged and operating in the manner and for the purposes herein before set forth.

47,061.—Skate Sharpener.—Fred. R. Willis, Waltham, Mass.:

I claim a file for sharpening skate iron, having either adjustible or fixed guides, and provided with a burnisher, substantially as herein described and for the purpose specified.

47,062.—Washing Machine.—Benjamin Wright, Hudson, Mich.:

I claim the rubber, c, the arms, G, the adjustable latch, j, and the thumbscrews, o, the whole constructed and arranged substantially as herein set forth.

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47,063.—Photographic Printing Frame.—Nathan L. English, Hartland 4 Corners, Vt., assignor to himself and Joseph F. Ladd, New York City:

I claim the combination of clamps formed by hoops or clasps hinged to the ends of springs with a printing board or pad substantially as and for the purpose herein set forth.

46,064.—Wool Press.—Ransom Greene, (assignor to Joseph Briggs,) New York City:

I claim the hinged top piece in combination with the folding sides, ends and bottom, substantially as described and specified.

47,065.—Universal Timepiece.—A. W. Hall, (assignor to B. W Robinson and S. P. Chapin,) New York City:

I claim, first, The employment or use of the dial of a clock or watch of two or more compound or double circles marked with different places, the two parts of each circle containing respectively the figures for the hour and minute hands calculated and arranged to correspond with the longitude of the places named on the circles substantially as herein specified for the purpose of allowing the ordinary hands of the clock or watch to keep the accurate time, at different localities.

Second, Making the circles of different colors, substantially as herein described, to aid the eye in tracing any given circle to any portion of the dial.

Third, The use of a supplementary adjustable minute hand in combination with the suppementary dial arranged on the face of the clock or watch substantially in the manner and for the purpose shown and described.

Fourth, So constructing the supplementary hand attached to and revolving with the ordinary minute hand, that it can be turned, or adjusted, as described without interfering with the ordinary minute hand or with the movement of the timepiece as described.

Fifth, Placing upon the different circles the names of other places than those for which the circles are calculated, at the same time naming the variations of said additional places from the circle, as and for the purpose set forth.

47,066.—Mop.—Joel and Henry R. Lee (assignors to themselves and W. C. Calkins), Galesburg, Ill.:

We claim, First, The forked ferrule, A, and the rods, B B, substantially as and for the purpose specified.

Second, The handle, C, spring, D, head piece, E, and stirrup, F, in combination with the forked ferrule, A, and rods, B B, substantially as and for the purpose specified.

47,067.—Wrench.—A. Y. McDonald (assignor to himself and John Morrison), Dubuque, Iowa:

I claim the elongated slot, d, in the bar, G, in combination with the screw, E, sliding jaw, D, projection, f, on bar, G, spring, H, of spiral or other form, and the holes, g, in the shank, A, substantially as and for the purpose set forth.

47,068.—Process for Removing Mineral, Gummy and Resinous Substances from Vegetable Fiber.—Antoni Meucci, Clinton, N. Y., assignor to Wm. E. Rider, New York City:

I claim the improved process of treating a vegetable material by treating it first in a dry state with gaseous substances produced by the action of nitro-muriatic acid upon carbonate of lime and iron, or their equivalents; second, in a wet state, with the same substances; and third, with a caustic alkali, substantially as set forth.

I also claim the process of treating the vegetable material which has been subjected to the first two operations above recited, with a mixture of caustic a kali and oil, substantially as set forth.

47,069.—Construction of Paper Boxes.—John W. Millett, Albany, N. Y., assignor to J. A. Sumner:

I claim, First, The method substantially as described of constructing the body and top of a paper box from one piece of paper without waste, as set forth.

Second, The method of stiffening the ends of a paper box made out of one strip of paper, substantially as described.

47,070.—Machine for Making Nails for Horse-shoes.—Silas Safford Putnam and Lucius H. Dwelley, of Dorchester, Mass., assignors to S. S. Putnam, & Co., Brooklyn, N. Y.:

We claim the drawing levers, c d e f, in combination with the movable patterns, h i j k, operating substantially as set forth.

Also the levers or jaws, c d e f, arranged in pairs, the patterns, h i j k, the motion of which toward or from the nail rod is controlled by the wedges, o p, and springs, m, or other suitable mechanical device, in combination with the cut-off, Q R, or its equivalent, operating substantially as set forth.

Also, We claim placing the ends of one pair of levers in advance of the ends of the other pair, and drawing them all simultaneously over the iron, substantially as set forth, for the purpose specified.

Also, We claim in horse-shoe nail machines the use of movable patterns or formers, operating substantially as set forth, for the purpose described.

47,071.—Machine for Making Horse-shoes.—Andrew J. Roberts, Boston, Mass., assignor to Benjamin F. Brown, Dorchester, Mass. Antedated March 13, 1865:

I claim, First, The use of the heavy drop hammer, i, for hammering the top of the shoe, arranged and operated by means of the devices herein above described.

Second, Holding, covering and uncovering the shoe, for the purpose specified by means of the projecting piece, x, of vertical bar, w, and plates, z z, arranged together and operated by the downward movement of the hammer, i, substantially as herein described.

Third, Flooding the shoe with cooling liquid before taking it from the machine, substantially in the manner and by the devices described, the same consisting in surrounding the mold block with the reservoir, h', filled, or nearly filled, with water or other suitable cooling liquid, which liquid is flowed at the proper times upon the shoe by means of the plunger, i', all arranged and operated substantially as described.

Fourth, The arrangement of devices for raising and lowering the punches, c' c', for the purpose specified, the same consisting of the wheel block, e', connecting and projecting arms, f' f', and rods, g' g', operating together substantially as described.

47,072.—Valve for Steam Engine.—James E. Thorpe, Providence, R. I., assignor to himself and Francis D. Ridder, Boston, Mass.:

I claim providing the valve with a single curved seat and a single corresponding bearing therefor, and with two chambers and a partition arranged in the valve, as described, and three ports leading from the seat, and with the area or width of the bearing surface of the partition greater than the mouth of the central port, the whole being substantially as hereinbefore described.

47,073.—Valve for Steam Pipe.—S. R. Warner (assignor to himself and A. R. Treadway), New Haven, Conn.:

I claim constructing a valve plate, as described, so that it may be set in pipes, in the manner and for the purpose specified.

47,074.—Filter.—Edouard Andries, Schaerbeck, Belgium. Patented in Belgium Feb. 20, 1864:

I claim the specific combination of the filtering media, arranged in layers, as set forth, the sponge at the end of the suction pipe and the receptacle below the sponge, for retaining the impurities.

47,075.—Pump.—Thomas Rider, Valparaiso, Chili:

I claim the mud box, E, applied in combination with the suction pipe, D, and foot valve, a, in the manner and for the purpose substantially as set forth.

[This invention consists in placing the foot valve on the top of a vertical pipe passing up through the bottom of what may be termed a mud box, or of a receptacle for the deposit of foreign matter, the specific gravity of which may be greater than that of water, said mud box being provided with an outlet at or near its bottom, in such a manner that the impurities which may be carried up by the current of water are prevented from interfering with the operation of the valve, and when the mud box is full it can be readily cleaned out with little labor or loss of time.]

47,076.—Fusible Plug for Boiler.—John Smith, Wentworth Road, Etc., Great Britain. Patented in England April 14, 1863:

I claim, First, The construction of fusible plugs, with recesses or grooves, for the purpose of increasing the power of the fusible metal to resist shearing, substantially as described.

Second, The construction of fusible plugs, with an additional part which may remain screwed into, or otherwise attached to the boiler, when the part containing the fusible metal is removed, as described.

47,077.—Construction of Fagots.—Francis William Webb, Monks Chippenhall, Crewe, Eng.:

I claim forming piles for the manufacture of steel-faced rails by the combination of old rails, puddle bars, and facing slabs of cast steel, the semi-crystalline puddle bars being interposed between the fibrous old rails and the crystalline steel slabs, so as to combine the materials of these two by a material which partakes of the nature of each, substantially as described.

I also claim forming the piles for the manufacture of steel-faced rails by the combination of iron bars with facing slabs of cast steel provided with intermediate projections on their inner surfaces for the purpose of facilitating the welding of the steel to the iron, substantially as set forth.

47,078.—Packing Projectiles for Rifled Ordnance.—Clifford Arick, St. Clairsville, Ohio:

I claim the annular key, a', in combination with an expanding disk, a, constructed, applied, and operated substantially as and for the purpose set forth

REISSUES.

1,911.—Straw Cutter.—DeWitt C. Cumings, Fulton, N. Y. Patented Aug. 7, 1857. Reissued Nov. 8, 1859.

I claim, First, Operating the adjustable lower feed roll by means of a spur wheel hung in a vibrating frame or yoke, the axis of which is connected with the said roller by means of an universal coupling, when said roller is supported on springs so as to be elastic or yielding, substantially as and for the purpose described.

I also claim the employment of a cylinder, provided with a knife or knives which have an upward cylindrical cut, when the same is arranged with two independent feed rollers, the lower one of which is supported on a spring or springs, substantially as and for the purpose herein described.

1,912.—(Div. 1.)—Horse Rake.—Chas. Mason, Robert W. Fenwick and DeWitt C. Lawrence, Washington, D. C., assignees by mesne assignment of Harvey W. Sabin, Canandaigua, N. Y. Patented Dec. 3, 1850. Extended seven years from Dec. 3, 1864:

We claim, First, An oscillating horse hay rake, which discharges its gathered load by the draft or power of the team, substantially as described.

Second, A wheeled horse hay rake, both capable of discharging its gathered load upon the ground by the draft of the team, and automatically resetting itself to gather a fresh load, substantially as described.

Third, An oscillating horse rake (the teeth of which do not rotate with their shaft), so constructed that its teeth may either be elevated by the draft of the team or by the attendant, substantially as described.

1,913.—(Div. 2.)—Horse Rake.—Chas. Mason, Robert W. Fenwick and Dewitt C. Lawrence, Washington, D. C., assignees by mesne assignment of Harvey W. Sabin, Canandaigua, N. Y. Patented Dec. 3, 1850. Extended seven years from Dec. 3, 1864:

We claim, First, Arranging rake teeth directly on the axle of the carriage wheels, and so that they can articulate upon said axle, for the purpose set forth.

Second, Arranging an oscillating bar for raising rake teeth, directly on the axle of the carriage wheels, and so that it can articulate on said axle, for the purpose set forth.

Third, Arranging an oscillating bar for exerting pressure upon rake teeth, upon the axle of the carriage wheels, and so that it can articulate on said axle, for the purpose set forth.

Fourth, Arranging an oscillating pressure lever, or a coupling lever on the axle of the carriage wheels, and so that either or both can articulate on said axle, for the purpose set forth.

Fifth, Arranging a clearer to rake teeth directly upon the axle of the carriage wheels, said axle extending entirely across the carriage frame, and so that it can articulate or oscillate on said axle, for the purpose set forth.

1,914.—(Div. 3.)—Horse Rake.—Chas. Mason, Robert W. Fenwick and DeWitt C. Lawrence, Washington, D. C., assignees by mesne assignment of Harvey W. Sabin, Canandaigua, N. Y. Patented Dec. 3, 1850. Extended:

We claim, First, The application of pressure, at the will of the operator, to metallic spring rake teeth, which are so constructed as to have a spring action within themselves from their gathering ends to the point, or forward thereof, where the pressure is applied, to hold them down to their work, substantially as herein described.

Second, The combination of independently articulating rake teeth, which are springs within themselves, and a pressure contrivance, which is under the control of the operator, substantially as and for the purpose herein described.

1,915.—(Div. 4.)—Horse Rake.—Chas. Mason, Robert W. Fenwick and DeWitt C. Lawrence, Washington, D. C., assignees by mesne assignment of Harvey W. Sabin, Canandaigua, N. Y. Patented Dec. 3, 1850. Extended:

We claim arranging rake teeth on articulating tubular, laterally-bracing and vertically-supporting eye bearings, so that the attaching end of each tooth shall cross or intersect a vertical plane passing longitudinally through the axis of the bearings, substantially as described.

1,916.—(Div. A.)—Die for Carriage Bolt.—Wm. J. Clark, Southington, Conn. Patented Aug. 2, 1864. Antedated Feb. 2, 1864:

I claim the combination and use of metallic dies, for the purpose of giving an angular shape or form to a portion of a cylindrical bolt, by compression laterally, leaving the remaining portion of the bolt in its original round form, and which dies also serve the purpose of an anvil, upon which the head of the bolt is formed, by upsetting a projecting portion thereof, substantially as described.

1,917.—Bolt.—Wm. J. Clark, Southington, Conn. Patented Aug. 2, 1864. Antedated Feb. 2, 1864:

I claim a bolt made from a round rod or bar, a portion of which bolt shall be square or angular, and a portion round, as in the rod or bar, and so that the sectional areas of the square and round portions shall be similar, the diameter of the round greater than the distance from face to face of said square portion, and the distance from corner to corner diagonally of the square portion be greater than the diameter of the round, substantially as described.

1,918.—Rendering Artificial Light the same as Daylight.—Noah H. Gillet, New York City. Patented January 19, 1864:

I claim rendering artificial light the same color or effect as daylight, by an intervening glass of the color specified.

And in combination therewith, I claim the employment of a reflector, substantially as specified.

1,919.—Hominy Mill.—R. E. Richardson (assignee by mesne assignments of J. B. Gowdy and J. A. Welsh), Xenia, Ohio. Patented Aug. 11, 1857.

I claim, First, Constructing a hominy mill with a series of chambers or compartments, placed one above another, substantially as specified.

Second, In combination with a series of compartments, as described, I claim the central openings for the passage of the grain, substantially as set forth.

Third, I claim the beaters, f, when arranged to operate in connection with a series of chambers, as herein described.

Fourth, I claim the tubular shaft, C, arranged to operate as set forth.

Fifth, I claim the deflecting flanges, e, or their equivalents, when arranged and operating substantially as herein set forth.

1,920.—Fruit Can.—Wm. W. Lyman, West Meriden, Conn. Patented June 10, 1862:

I claim, First, The combination of the can with a stopper of such size relatively to the neck of the can as to admit between the neck and stopper an elastic packing ring of the requisite thickness to permit the introduction of a pin at its side, substantially as set forth.

Second, The combination of the said can and the stopper with a flange, substantially as set forth, to prevent the skewing or displacement of the packing ring when the stopper is applied to the can

Third, The combination of the stopper of the jar with a flange situated beneath the position of the packing ring, substantially as set forth.

Fourth, The recess in the flange to permit the introduction of the pin at the side of the packing ring which is overlapped by the flange, substantially as set forth.

1,921.—Horse Rake.—Gideon Peirce, Ercildown, Pa. Patented Nov. 29, 1859. Reissued March 22, 1864:

First, I claim a toothless revolving axle supporting the main frame, and provided at any point between the ground wheels with a wheel or roller for raising the rake teeth, when used in combination with teeth pivoted in the rear of the said axle, and drawn up by leverage, substantially as herein described.

Second, I claim the vertically adjustable bar, G, extending partially or wholly across the machine, supported upon guide pins, g g, and provided with vertical mortises through which the teeth pass, substantially as set forth.

Third, I claim the combination of the rocking frame, d, the rack, c, and the lever, I, for raising the teeth by the power of the horse, substantially in the manner described.

1,922.—Process for Extracting Tanbark.—S. W. Pingree, Lawrence, Mass. Patented March 1, 1864:

I claim, First, The within described process of extracting tanbark by first swelling the bark with water or weak tan liquor and heating it with steam, and afterward steeping with cold water or weak tan liquor, substantially in the manner set forth.

Second, Introducing steam into the bark contained in a leach at different points through a pipe, D, in the manner and for the purpose substantially as described.

1,923.—Hulling and Scouring Machine.—Oliver P. Stevens, Cleveland, Ohio. Patented July 1, 1856:

I claim, First, The use or employment of perforated revolving fans or beaters for the purpose of hulling or scouring grain, seeds, etc.

Second, Lining and arming the fan or beater wheel casing with teeth, substantially as described, for the purposes set forth.

Third, The arrangement of the upper section of the fan or beater wheel casing, c, in relation to the chimney, O, in combination with the fans or beaters, f g, and guides, l' l', combined as described, and operating in the manner and for the purpose herein before described.

Fourth, The adjustable guides, l' l', combined as described, and operating in the manner and for the purpose herein before described.

Fifth, The air passages or chambers, B B, arranged in each end and on top of the fan or beater wheel casing, in combination with the vertical trunk, B', as herein described, and for the purposes specified.

Sixth, The valve, F, operated in the manner described, in combination with the chimney, O, for the purpose specified.

Seventh, Pulverizing friable substances by means of revolving beaters, surrounded with a casing, substantially as described.

1,924.—Amalgamator.—Thomas Varney, San Francisco, Cal. Patented Dec. 16, 1862:

I claim the curved plates, constructed substantially in the manner and for the purpose set forth.

DESIGN.

2,040.—Standard or Bullion Scale.—Lindsay J. Howe and John V. Bouvier, New York City.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many

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millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue Address MUNN & CO., No 37 Park Row, New York.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, &c.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They thing they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of pateuts, but should give ninety days' notice of their intention.

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

Notes and Queries

A. M. B., of Pa.—Elastic sandals such as you propose have been in use for years.

W. H. H., of Cal.—We shall publish your interesting letter. Vol. XII., No. 4, is out of print, as are also several back numbers of Vol. XI.

J. C. B., of Wis.—Matches are made with stearine the same as those with sulphur. The flame of phosphorus is not sufficiently hot to set wood on fire, and sulphur is therefore used to perform this office, but paraffine or stearine may be substituted. Binoxide of lead is sometimes employed to furnish oxygen for the combustion.

Y. C., of N. Y.—To obtain pure oxide of zinc place some zinc in one crucible and cover with another, luting the joint with clay. Then place in a furnace and heat red hot.

W. L. Z., of Pa.—Cocoa-nut oil is soluble in alcohol, benzole, and in the fatty and essential oils.

A. E. S., of N. Y.—At a guess we should say a three-bladed screw, eighteen inches diameter and thirty inches pitch, would be ample for your engine, but you have not sent any dimensions either of your boat or the size of the cylinder. The size of a screw can only be determined by the area of the immersed midship section, and the pitch by the work to be done—by this is meant, whether speed or hard work, such as towing, is desired. An engine of one-horse power means nothing; any cylinder from two to ten inches may be one-horse power. If you tell us the size of your cylinder and length of the stroke we shall be better able to judge whether a boat twenty feet long is too large or too small.

G. F. M., of Mo.—Address J. E. Stevenson, No. 200 Broadway, for a turbine wheel.

N. S., of Mass.—Suppose the base line in measuring a degree were measured by a stick cut by chance at any length, when the number of times that this stick was contained in an arc was known, could not the 1-10,000,000th of the arc be ascertained? For seventy years the world of science has been engaged in long-winded discussions of the comparative advantage of the foot and meter as units of measure; in our opinion the question is settled by the meter being the unit in the decimal system of so large a part of the civilized world. Practically the standard is not the fraction of an arc, but the measures in general use.

C. E. S., of Tenn.—The ball would return to the earth with the same force with which it left.

C. B. D., of Conn.—Your belt will work with a half twist. You may set the center of both pulleys in line, or a little above or below it; if the pulleys have a full rounded face the belt will keep its place, even if the centers do not coincide.

J. McD., of Vt.—It will cost $25 to have the sediment from the hair oil analyzed.

C. H. M., of Vt.—Files re-cut with sulphuric acid are worthless. The first rub grates the teeth all off.

J. R. W., of Ill.—You had better try the twist drills you speak of. We have found them superior tools. We refer you to our advertising columns for further information.

E. K. C., of Me.—If you will look in our advertising columns you will see an advertisement of the Delaware Literary Institute; by corresponding with the teachers you will learn more than we can tell you.

P. H. C., of Conn.—We know of no silver-plating fluid good for anything. These generally attack the copper when used on brass, and leave a thin surface coat of tin, which is soon worn off.

F. H., of Ill.—It is customary to cover iron rods with brass by drawing a thin coating or tube over the rod.

E. J., of C. E.—A six-inch belt is ample to transmit six-horse power. Five inches will answer if the speed is high.

J. C., of Mass.—The article of Baron Liebig for invention was taken from the *Irish Agricultural Review;* we know nothing further concerning it.

T. P. H., of R. I.—The eccentric is always in one position with reference to the crank, no matter what the kind of engine, upright or horizontal.

C. A. S., of Conn.—Cast-iron sustains 100,000 pounds pressure to the square inch without disintegration; brick sustains 562. You can judge which is best for a column.

A correspondent from Montpelier, Vt., sends us a sketch of an improved grate for sugar arches, which appears to be novel and useful, but he failed to sign his name to his letter, therefore we cannot correspond with him on the subject.

James Emerson writes to us from some unknown place and sends a model of a projectile. We should write to Mr. Emerson if we knew where to address him.

J. R. M., of Tenn.—You can probably get your gutta-percha scraps into a single mass by dissolving them in benzine, rolling into a thin sheet, and drying.

S. S. W., of Pa.—We have published all the facts in relation to magnesium. The claim of the British to the discovery of anasthæsia is ridiculous.

W. S., of N. Y.—According to the experiments of Morin the friction on a long axle is the same as on a short one, provided the size of the axle and the load or aggregate pressure are the same in both cases. In reply to your question, "Which of two truck journals would run the easiest—one of the present style of construction, with the wheel tight on the axle journal, 2¼ inches in diameter by 5¼ inches in length, with the bearing on the top of the axle and a wheel 33 inches in diameter; or one with the wheel loose on the axle, with a journal 3¼ inches in diameter by 15 inches in length, with the bearing on the bottom—diameter of wheel 33 inches?" we should say there would be no difference in the friction.

E. J. C., of N. Y.—If a south wind melts ice faster than a heavy rain we suppose it must be because the wind is warmer than the rain.

D. S., of Mass.—It is very singular that Messrs. W. D. Andrews & Co. could not tell you where oscillating engines are used in steamboats, since they are now putting in a pair in a small boat 90 feet long, just launched on the Harlem River. There are hundreds of oscillating engines in this country in tug boats and steamboats of all classes. If you can get on any of the new revenue steam cutters you will see some fine ones. There must be a number of them in Boston also.

R. W., of U. S. N.—No person in Government employ, except persons holding office at the Patent Office, are, by reason of such employment, prevented from taking out patents. We are constantly taking out patents for officers and men in the army and navy.

G. W. S., of C. W.—Messrs. T. Kingsford & Son, of Oswego, N. Y., are manufacturers of starch on a large scale. There are also five manufactories in Stowe, Vt. You can get the address of the proprietors by writing to the postmaster.

F. D. S., of Wis.—The little article on the appearance of the sun at the north pole was written in this office by one of the editors, and if you wrote the same article it is a very extraordinary coincidence.

T. B., of Mo.—You will find a small turbine better for your purpose than a Barker mill. Write to some of the manufacturers.

Geo. F. Warren, of Boston, Mass., wants to correspond with some one who can raise a vessel sunk in 42 feet water.

A. E. T., of Ohio.—You will find an admirable treatise on electricity in Silliman's Philosophy, published by H. C. Peck and Theo. Bliss, of Philadelphia.

G. H. M., of N. Y.—You can remove iodine from cloth with alcohol if you apply it promptly.

F. D., of N. Y.—At the level of the sea, water can be raised by suction about 34 feet; the valve, therefore, attached to your pump rod cannot be at a greater hight than this. The hight to which the water may be lifted above the valve is limited only by the strength of the materials.

A. J., of Md.—The discovery of a practical cure for rancidity of butter would be a fortune.

W. A. M., of Pa.—To prepare the surface of paper so that by moistening it it will adhere to other paper unprepared, you have only to wash the surface with British gum or mucilage and let it dry.

A. B. K., of Mass.—India-rubber can be dissolved to a soft paste in petroleum naphtha or benzine. In thin sheets it is transparent when it first exudes from the tree, but becomes opaque by exposure to the air. We do not know Geo. B. Brayton's address.

F. G., of R. I.—It is not new to bevel the inside edges of window bars so as to cause the moisture to run off.

J. C. M., of Pa.—We don't know any queensware manufactory in this country.

R. M. V., of Md.—We have not been able to find a reliable receipt for enameling artificial legs.

G. D. C., of Conn.—"Glazing" knife blades, as we understand it, refers to giving them the final polish on a buff or crocus wheel. Dana's Mineralogy is the book you want. Address D Appleton & Co., N. Y.

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NOTICE TO SUBSCRIBERS.

The first five numbers of the present volume of the SCIENTIFIC AMERICAN being out of print, we shall commence the time of each new subscriber from the date of receipt of the order, unless the writer states specifically that he wishes such back numbers as can be furnished.

SPECIAL NOTICE TO INVENTORS.

The money receipts on account of patent business, which have heretofore been published in this column, and the notification of cases sent to the Patent Office, will for the present be discontinued. The receipt of specifications and money from inventors will be acknowledged promptly by mail.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

Back Numbers and Volumes of the "Scientific American."

VOLUME IV., AND VOLUME XI., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference Subscribers should not fail to preserve their numbers for binding. VOLS. I., II., III., V., VI., VII., VIII., IX. and X., are out of print and cannot be supplied.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

F. B. HUNT'S HOOSIER FODDER CUTTER—PATENTED in the United States and Europe; the most popular cutter in use; it cuts with equal facility hay, straw and corn fodder; is simple and durable, and can be worked with ease by a boy of ten years, having the most simple and complete change of feed, cutting any length desired. This machine was patented Jan. 5, 1864, and was exhibited at twenty different State and County Fairs, at which it took 18 first and 2 second premiums. In each case failure to get the first premium the committees were divided—self-interest controlling the majority. Seldom has there anything become so suddenly popular and profitable as the Hoosier Fodder Cutter. All who have had any real experience or observation in the matter pronounce it a fixed fact—a success beyond all controversy. Although it has been but a short time since this machine was introduced, it has been conclusively proven that the fodder from an acre of corn cut or chaffed by this machine is worth the entire cost of making the crop. Machines and shop rights to manufacture for sale by TOBIAS, LANE & CO., Richmond, Ind. 15

WATER WHEELS.—J. E. STEVENSON, NO. 200 Broadway, N. Y., Hydraulic and Mechanical Engineer and Manufacturer of the HELICAL TURBINE WATER WHEEL. Particular attention paid to the improvement of Water Powers and Mill Sites. Surveys made; Plans, Specifications and Estimates furnished. General Agent for the purchase and sale of all kinds of Mill Property and Machinery. Contracts for furnishing Turbines, Mill Gearing, Shafting, Pulleys and all Iron Work for Cotton, Woolen, Grist and Saw-mills. 15 3*

VALUABLE DISCOVERY.—IT HAS BEEN ASCERTAINED that Railroad Ties may be preserved for a great length of time by the application to them of a composition discovered and lately patented by B. S. FOREMAN, Architect and Builder, at Morrison, Ill. 15 6*

I WISH TO DISPOSE OF ONE-FOURTH OR ONE-HALF of my Improved Magazine Fire-arm; fires 23 shots; cal. 54, and is operated by the hammer alone. Now in process of being patented. Address A. M. CONNETT, Box 648, Madison, Ind. 1*

NEEDLES.—LAND'S NEEDLE CO., MANUFACTURERS of Machine Spring Needles. These needles are made by patented machinery, and consequently we claim a uniformity of spring which cannot be obtained in the ordinary way of making. Address, with two samples inclosed, LAND'S NEEDLE COMPANY, Laconia, N. H. 15 tf

MACHINIST'S TOOLS AND BUSINESS FOR SALE, in Springfield, Mass, now doing a large and profitable business. For full particulars address Box 1066 P. O., Springfield, Mass. 15 4*

FOR SALE—A ROTARY STEAM POWER PUNCHING and Raising Press, with eight sets of dies complete, for tin box and can work. Address Box 848 Post-office, Philadelphia. 15 6*

NEW STEAM ENGINE FOR SALE—250 H. P., HORIZONTAL; cylinder 6 feet stroke, 30 inch diameter. Built at the Burdon Iron Works, Brooklyn, N. Y., where it may be seen. Apply to A. & P. ROBERTS & CO., Philadelphia, Pa., WILLIAM LILLY, Mauch Chunk, Pa., THOMAS BARBER, Allentown, Pa., or HUBBARD & WHITTAKER, Brooklyn, N. Y. 15 12

CAN I OBTAIN A PATENT?—FOR ADVICE AND instructions address MUNN & CO., No. 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN, $3 a year. 30,000 Patent Cases have been prepared by M. & Co.

RARE CHANCE.—VOLS. I., II., III., IV., V., VI., complete, new series, SCIENTIFIC AMERICAN, bound with morocco, back and tips, and marbled paper covers, illuminated, for sale reasonable. Address with return postage stamp, U. L. S., No. 37½ Washington avenue, Albany, N. Y. 1*

GREAT INVENTORS — FULTON, STEVENSON, Davy, Gottenburg. Archimedes, Daguerre, Morse, Whitney, Arkwright, Watt, with Portraits and descriptions. Also, Maj.-Gen. Terry, Miss Butt, Baron Cuvier, Sir John Herschel, Newton, Buffon, Howard, Buxton, Combe, Eustache, Gottfried, Burnett in his Comic Physiognomy, with 18 illustrations, P. Benson, Sr. EYE GLANCES ON BROADWAY—Illustrated; Color of Eyes, Blue, Brown, Black, Hazel; Size of the Eye; Place of the Iris; Curves of the Eyelids; Eyelashes. CHOICE OF OCCUPATION, or Pursuits in Life; What can the Boys do Best? Hippocrates and the Temperaments; Crazy Phrenologists RELIGIOUS—The "Still Small Voice;" Skepticism; Veneration; The Law of Progress; Color Blindness; Noses. REPORTERS AND REPORTING, with Portraits of MEMORY WOODFALL and JAMES PERRY. PSYCHOLOGY—A Lunatic's Experience; Chaos in the Brain; Longing to go up; Ride among the Stars; Visiting Jupiter; Coming to himself; Body Life and Soul Life. ETHNOLOGY—Nature in History; Climate and Vegetation; Climate and Color; North and South; Mixing the Races; How the Races die out. OUR SOCIAL RELATIONS—Matrimony; Let Girls be Girls; A Lesson for Wives; Marrying for show. With 57 engraved illustrations. PHRENOLOGICAL JOURNAL for APRIL. A Double Number. Only 20 cents by first post, or $2 a year. Newsmen have it. Address Messrs. FOWLER & WELLS, No. 389 Broadway, N. Y. 15 2*

CHIEF QUARTERMASTER'S OFFICE,
No. 1139 Girard street, Philadelphia Depot March 27, 1865.

SEALED PROPOSALS WILL BE RECEIVED AT this office till TUESDAY, April 4, 1865, at 12 o'clock M., for delivering at the Schuylkill Arsenal, in merchantable packages (cases to be made to conform to specifications at this office):—

Wool Blankets, army standard.
Haversacks, do.
Canteens, do.
Cavalry Guidons, do.
Cavalry Standards. do.
National Colors, Infantry, do.
Regimental Colors, Infantry, do.
Artillery Trumpet Cords and Tassels, do.
½-inch Dark Blue Worsted Lace, do.
½-inch Dark Blue Worsted Lace, do.
1½-inch Dark Blue Worsted Lace, do.
¼-inch Yellow Worsted Lace. do.
½ inch Yellow Worsted Lace, do.
1½-inch Yellow Worsted Lace, do.
½-inch Scarlet Worsted Lace, do.
1½-inch Scarlet Worsted Lace, do.
¼-inch Sky-Blue Worsted Lace, do.
½-inch Scarlet Silk Lace, do.
Ax Handles. do.
Hatchet Handles, do.
Regimental General Order Books, do.
Regimental Letter Books, do.
Regimental Descriptive Books, do.
Target Practice Books, do.
Great Coat Lining, sample required.
Sack Coat Lining, do.

Parties offering goods should make separate proposals for each article offered, and must distinctly state in their bids when they will commence their deliveries, the quantity they propose to furnish each week, the price (*which should be written both in words and figures*), and conform to the terms of this advertisement, *a copy of which should accompany each proposal.*

Standard samples of the articles required may be seen at this office.

Samples, when submitted, must be marked and numbered to correspond with the proposals; and the parties thereto must guarantee that the goods shall be, in every respect, equal to army standard, otherwise the proposals will not be considered.

Bids will be opened on Tuesday, April 14, 1865, at 12 o'clock M., and bidders are requested to be present.

Each bid must be guaranteed by two responsible persons, whose signatures must be appended to the guaranty, and certified to as being good and sufficient security for the amount involved, by some public functionary of the United States.

All proposals should be made out on the regular forms, which will be furnished on application at this office.

The right is reserved to reject any bid deemed unreasonable, and no bid from a defaulting contractor will be received.

Indorse envelope "Proposal for (here insert the name of the article offered)" and address Col. WILLIAM W. McKIM,
1 Chief Quartermaster, Philadelphia Depot.

CHIEF QUARTERMASTER'S OFFICE,
No. 1139 Girard street, Philadelphia Depot, March 31, 1865.

SEALED PROPOSALS WILL BE RECEIVED AT this office till MONDAY, April 10, 1865, at 12 o'clock M., for delivery at the Schuylkill Arsenal, in merchantable packages (cases to be made to conform to specifications at this office),

3-4 Canton Flannel for Drawers, army standard.
Stockings, do.
Pegged Boots for Cavalry, do.
Pegged Bootees for Infantry, do.
Hospital Tents and Flies, do.
Forage Caps, do.

Samples of the standard articles required may be seen at this office.

Parties offering goods should make separate proposals for each article offered and must distinctly state in their bids when they will commence their deliveries, the quantity they propose to furnish each week, the price (*which should be written both in words and figures*), and conform to the terms of this advertisement, *a copy of which should accompany each proposal.*

Bids will be opened on Monday, April 10, 1865, at 12 o'clock M., and bidders are requested to be present.

Each bid must be guaranteed by two responsible persons, whose signatures must be appended to the guaranty, and certified to as being good and sufficient security for the amount involved, by some public functionary of the United States.

All proposals should be made out on the regular forms, which will be furnished on application at this office.

The right is reserved to reject any bid deemed unreasonable, and no bid from a defaulting contractor will be received.

Indorse envelope, "Proposals for (here insert the name of the article offered)," and address Colonel WILLIAM W. McKIM, Chief Quartermaster,
15 2 Philadelphia Depot.

Q. M. GENERAL'S OFFICE, WASHINGTON, March 30, 1865.

ARMY SUPPLIES.—SEALED PROPOSALS WILL be received at the office of Army Clothing and Equipage, New York City, until 12 o'clock M., on WEDNESDAY, April 5th, for furnishing by contract at the Depot of Army Clothing and Equipage, New York,

One Hundred and Fifty Sets Six-mule Wagon Harness Complete, in Good New Boxes, to be made according to specification, which can be seen at the Office of Army Clothing and Equipage, New York City.

Bidders will state the quantity they propose to furnish, and the shortest time in which they can deliver.

All proposals should be accompanied by a proper guaranty for the faithful performance of a contract.

The right is reserved to the United States to reject any part or the whole of the bids that may be deemed objectionable.

Proposals should be indorsed "Proposals for furnishing Harness," and addressed to Bt. Brig.-Gen. D. H. VINTON,
1 D. Q. M. Gen., New York City.

LABORATORY OF INDUSTRIAL CHEMISTRY—Advices and consultations on Chemistry applied to Arts and Manufactures, Metallurgy, Etc., Plans of Factories, Drawings of Apparatus, Analysis and Commercial Assays. Address Prof. H. DUSSAUCE, Chemist, New Lebanon, N. Y. 1

PETROLEUM.—PLANS OF OIL FACTORIES, PROCESSES to Manufacture, Purify, Refine, Deodorize and Discolorize Petroleum Oils, Recipes to Prepare Lubricating Oils, Paraffine, Benzine, Colors of Coal Tar, Examination of Oil Lands, and Analysis of Raw Material, Etc. Address Prof. H. DUSSAUCE, Chemist, New Lebanon, N. Y. 1

INCRUSTATION.—WINANS' POWDER REMOVES and prevents scale—a certain remedy at trifling cost: beware of imitations. References everywhere. H. N. WINANS, N. Y. 15 4*

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PLATINA PLATE AND WIRE—BEST FRENCH IMPORTED, by SAML. S. WHITE, No. 658 Broadway. 15 4*

THE ADVERTISER, WHO HAS HAD A LENGTHY business experience, purposes shortly to visit the cities of Europe, and will assume charge of the introduction of a few American manufactures—patent rights, etc., which may be entrusted to him. Communications, stating particulars and address, may be addressed P. M. F., Box 1232, P. O., New York. 15 2

HORSE-SHOES.—JOHNSON'S PATENT HORSE-SHOES attached to the hoof without nails are the best shoes for an interfering or cutting horse. Illustrated in SCIENTIFIC AMERICAN, Vol. XII., No. 14. For particulars address JOHN M. JOHNSON, Station D, New York. 15 2*

WANTED—A FOREMAN IN A FOUNDERY AND Manufacturing Establishment. Address P. O. Box 387, Cincinnati, Ohio. 1*

THE UNION MOLDING MACHINE—BEST IN USE.—For circulars address H. A. LEE, patentee, Worcester, Mass. 15 4*

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12 8* E. CLARK, No. 321 Spring street, New York.

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N. B. The object of this advertisement is to obtain control of a few meritorious inventions already patented in Great Britain, and no application from inventors will be entertained except their invention shall have been provisionally protected prior to the publication of the invention in America.

For references apply to any Mercantile Association or Trade Protective Society in Great Britain. 12 12*

WANTED—TO CORRESPOND WITH SOME PERSON or Manufacturer who has for sale or manufactures Rivet-making machines, which can be used to make rivets from 3-16ths 3-8th inch. Address R. H. W, P. O. Box 132, Reading, Pa. 12

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For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN,
No. 37 Park Row, New York City

OFFICE A. A. PROVOST-MARSHAL-GENERAL,
AND SUP'T VOLUNTEER RECRUITING SERVICE SOUTHERN DIVISION OF NEW YORK, NEW YORK, March 20, 1865.

THE FOLLOWING CIRCULAR IS PUBLISHED FOR the information of those concerned.

RICHARD I. DODGE, Major 12th Infantry, A. A. P. M. General.

WAR DEPARTMENT. PROVOST-MARSHAL-GENERAL'S OFFICE. WASHINGTON, D. C., March 11, 1865.

CIRCULAR No. 6.—In conformity with the proclamation of the President herewith published, all officers and employees of this Bureau are instructed to give prompt attention to the receiving and forwarding of such deserters as present themselves in accordance with its provisions.

"BY THE PRESIDENT OF THE UNITED STATES OF AMERICA:
"A PROCLAMATION.

"Whereas the twenty-first section of the act of Congress, approved on the third instant, entitled 'An act to amend the several acts heretofore passed to provide for the enrolling and calling out the national forces, and for other purposes,' requires, 'that in addition to the other lawful penalties of the crime of desertion from the military or naval service, all persons who have deserted the military or naval service of the United States who shall not return to said service, or report themselves to a Provost-Marshal within sixty days after the proclamation hereinafter mentioned, shall be deemed and taken to have voluntarily relinquished and forfeited their rights of citizenship and their rights to become citizens, and such deserters shall be forever incapable of holding any office of trust or profit under the United States, or of exercising any rights of citizens thereof; and all persons who shall hereafter desert the military or naval service, and all persons who, being duly enrolled, shall depart the jurisdiction of the district in which he is enrolled, or go beyond the limits of the United States with intent to avoid any draft into the military or naval service, duly ordered, shall be liable to the penalties of this section. And the President is hereby authorized and required forthwith, on the passage of this act, to issue his proclamation setting forth the provisions of this section, in which Proclamation the President is requested to notify all deserters returning within sixty days, as aforesaid, that they shall be pardoned on condition of returning to their regiments and companies, or to such other organizations as they may be assigned to, and serve the remainder of their original terms of enlistment, and, in addition thereto, a period equal to the time lost by desertion.

"In testimony whereof, I have hereunto set my hand, and caused the seal of the United States to be affixed.

"Done at the City of Washington, this eleventh day of March, in the year of our Lord one thousand eight hundred and sixty-
[L. S.] five, and of the independence of the United States, the eighty-ninth.

"ABRAHAM LINCOLN.

"By the President: WILLIAM H. SEWARD, Secretary of State."

The records and returns of these deserters will be made up in the same manner as is provided for in other cases by existing regulations, except that it will be noted on the book of deserters arrested, opposite the name of deserter, the fact of his having voluntarily surrendered himself in conformity with the President's Proclamation; and the number; thus surrendering themselves to be separately stated on the report to this office.

The Secretary of War directs that no reward be paid for the arrest of deserters who may be arrested subsequent to the receipt of this order by the District Provost-Marshals.

14 3t JAMES B. FRY, Provost Marshal-General.

FOR SALE—TO PARTIES INTERESTED IN MINES in Mexico and Lower California—Plans and specifications of a Smelting Furnace and a combination of cheap chemicals for fluxing, for reducing gold and silver ores that cannot be worked by any other way than fire treatment; works cheap and quick; a patent right can be had; one-quarter interest is reserved; none but responsible parties need apply. Address C. S. F., Box 1,412 Post-office. 14 5*

MACHINERY FOR SALE.—TWO 15-HORSE STEAM Engines, with cylinder boilers; one "Kirk's" Steam Hammer; one large Trip Hammer; seven Slide Lathes; two Iron Planers; one Bolt Cutter; two Upright Drills; two Fan Blowers; one pair heavy Shears; two large Heating Furnaces; one Foundery Cupola, Oven, Etc.; two Water Tanks; 6,000 pounds Anvil and Trip-Hammer Dies; Pumps; Gifford's Injector; Anvils, Vices, Shafting, Pulleys, Etc., and Tools for Axle work. Address CHAS. H. SMITH, No. 135 North Third street, Philadelphia. 14 3*

ESTABLISHED 1826.—WORLD'S FAIR AND AMERICAN Institute Prize Medal Turning Lathes for Foot and Steam Power, manufactured by JAMES STEWARTS SON, No. 252 Canal street, New York. Amateur's Turning Lathes made to order. 14 8*

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No. 451 EIGHTH AVENUE, NEW YORK, March 9, 1865.

CAVALRY AND ARTILLERY HORSES WANTED.—I will purchase in open market all horses that may be presented and pass inspection at the Government stables on Thirty-fifth street, near Tenth avenue, until further notice, as follows:—

Cavalry horses, 5 to 10 years old, 15 to 16 hands high.

Artillery horses, 6 to 10 years old, 15½ hands high, and over 1,100 pounds, and dark color.

Price for cavalry horses, $175. Price for artillery horses, $180. Payable in such funds as may be furnished by the Government.

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A SAFETY MONEY DRAWER.

It is a common occurrence in this and other cities for money drawers to be rifled of their contents by some adroit till thief. If the proprietor turn his back for a moment, possibly the customer who only entered for the purpose, reaches his hand over and dexterously abstracts the change. This practice is very easily stopped by the application of a simple detective apparatus which is perfectly invisible outwardly and is very ingenious in construction.

The machine itself is very simple and is no larger externally than the works of a clock. It is difficult to describe without the aid of an illustration, which we have not room to produce at present, but an idea may be formed of its principle when we say that a number of small iron finger plates project below the bottom of the drawer, (where it is caught for the purpose of pulling it open) which must be pressed before the drawer can be pulled out. These plates connect with a series of small latches inside the drawer which lock it each time so that it cannot be opened unless the proper plate is pressed by the finger, but on being pressed the drawer slides open without ringing the alarm bell. No noise occurs when the drawer is properly opened by those who are in the secret of its operation. Thirty changes can be made in the arrangement of the latches so that even if a dishonest person should find out one movement it would be of no advantage, as the checks could be altered every day in the month. When meddled or tampered with by ignorant persons the drawer locks itself completely and gives the alarm so that a key must be used to set the latches or checks free again.

The price of the drawers with patent alarm lock varies from $7·00 to $10·00 according to the kind of wood used in their manufacture. All orders must be addressed to Thomas Turner, Willimantic, Conn.

WATER BATHS IN COOKING.

"A smoky chimney and a scolding wife," was a proverb applicable to the old days of open fire-places, but the trouble from smoke has been pretty effectually overcome by the general use of stoves. In these days, the temper of cooks and housewives is probably more frequently disturbed by the burning of milk or other article on the sides of the kettle, than from any other cause. This difficulty is completely overcome by the use of a water bath.

A water bath may be improvised by simply setting a smaller kettle into a larger one. In boiling milk, the milk may be put into a porcelain or earthen pitcher, and the pitcher set into a kettle of boiling water.

Double kettles for water baths are manufactured and may be found in the markets, and generally those who have once used them would sooner give up any other utensil than part with them. They are so entirely effectual in preventing any substance from burning on the sides of the vessel, and they deliver their contents so white and clean, it is a luxury and satisfaction to use them. The time will come when a water bath will be deemed as indispensable in the kitchen, as it is now in the chemical laboratory.

SAILING OF PROFESSOR AGASSIZ.

Professor Agassiz and his companions, twelve in all, sailed from this port on the 30th of March, for Rio Janeiro, Brazil. Mr. Thayer, a wealthy citizen of Boston, having heard that Professor Agassiz would like to visit South America to make some observations on glacial action, wrote him a note asking him how many companions he desired and what would be the expense. Prof. Agassiz replied, that a company of eight would be sufficient, and that it would cost them about $2,500 apiece. Mr. Thayer told him to go forward and send the bills to him. The Pacific Mail Steamship Company tendered to the party a free passage on their fine steamer, the *Colorado*, and they are now on their way to South America.

A New Substitute for Coffee.

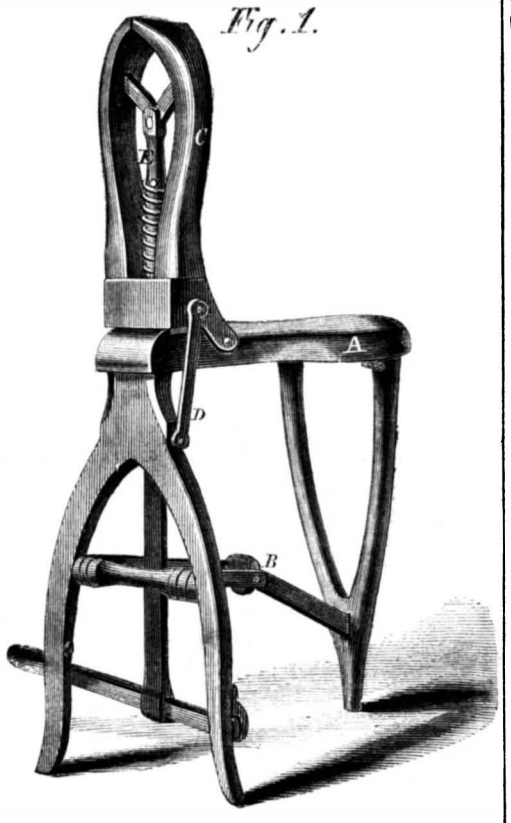
We received some time since a bag of seed from Mr. Earl Flint, of Granada, Nicaragua, which he averred to be so nearly allied to coffee in flavor, as to be undetected therefrom by most persons. We have, accordingly, roasted and ground the seed and find it to be a good *substitute* for coffee, as it possesses both the flavor and odor of the poorer brands of the genuine article. Many persons are not judges of coffee, and to such this seed might prove palatable and economical at the present prices for pure Java.

Our correspondent says this is called *Singna Pajaro* in Spanish, which sounds very much like bird seed, when translated, and the plant is very troublesome, (in what respect is not stated,) growing wild all over Nicaragua; the seed is easily harvested and two crops a year may be obtained. Such abundance and its palpable resemblance to coffee, might make it of some use commercially, if it should be found innoxious to the system.

BROCKWAY'S STITCHING HORSE.

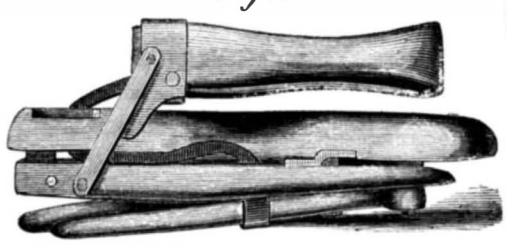
In saddle and harness-makers' shops, where there is sometimes but little room, the stitching horse, or that appurtenance which is used for holding leather straps, while they are sewed, occupies a great deal of space which could be used for other purposes.

Fig. 1.



The object of this invention is to produce a stitching horse that can be easily folded up when not in use, so that it will appear as in Fig. 2, thus rendering it portable, so that it can be used for army purposes and conveniently stowed away when not wanted. The construction of the horse is as follows—the legs are hinged to the seat, A, so that they can turn up toward it, and the reach, B, is so contrived that it will allow the legs to approach the seat in the manner shown in Fig. 2. The clamp, C, also turns

Fig. 2.



down, and has an iron strap, D, which keeps it rigid when in use. The jaws of the clamp are provided with a toggle joint to which is connected a rod, E. This rod works the treadle, and by depressing the latter the work is held fast as in all others. There are no other peculiarities about this arrangement, and the engravings give a clear idea of its principal object. It was patented through the Scientific American Patent Agency, on the 16th of December, 1864, by Geo. F. Brockway, of the U. S. Army. For further information address L. Allen, Webster, N. Y

School of Industrial Science.—A gentlemen whose name and residence are not given, has appropriated one hundred thousand dollars to constitute a fund for the support of a school of industrial science in Worcester, Massachusetts, on condition that the citizens of that place furnish the means for purchasing a lot of ground, and erecting suitable buildings thereon. It is understood, says the *Spy*, that this institution will afford instruction to persons intending to enter upon practical life, such as manufacturers, farmers, mechanics, or to pursue various branches of commercial business. The school will be free to the inhabitants of the city and county of Worcester.

A good thing is attributed to Hugh McCulloch, the new Secretary of the Treasury. A frightened speculator was asking him to arrest the downward tendency of gold. "Well, my good friend," was the Secretary's reply, "if you can get Grant, Sherman and Sheridan to let the rebels whip them, you will be gratified; but I am afraid they won't oblige you."

Mr. E. F. Shindel of Tamaqua, Pa., wishes to procure paper-making machinery.

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